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INDUSTRIAL EDUCATION

OUTLINES OF INSTRUCTION

IN THE

NEEDLE-WORKING TRADE

By J. V. Lynn

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FOR USE IN
PUBLIC PART-TIME AND FACTORY VESTIBULE SCHOOLS

ENGINEERING EXTENSION DEPARTMENT
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OUTLINES OF INSTRUCTION IN THE NEEDLE-WORKING TRADE

By J. V. Lynn, Associate Professor Vocational Education

I. INTRODUCTION

Education is a four-fold process in preparation for full or complete living. To be adequately prepared requires that the individual shall not be lacking in any one of the four elements necessary. First of all there must be health. Such instruction as will promote physical wellbeing is the foundation. Upon this foundation is laid the ability to earn a livelihood, so the second instructional process is preparation to do one's share of the productive work of the world. Third, and perhaps the largest in point of volume, are the social and civic relationships, the ability to live among one's fellows. Fourth and last is the profitable employment of leisure time. A well rounded education therefore includes the physical, vocational, social-civic, and avocational elements. Each is required, and each should have a controlling purpose within its own field. Physical education is concerned with physique and nothing else. Vocational education is concerned with intelligent skilled production, and that alone. One cannot usurp the place of the others, but each is supreme in its own field.

Having all this in mind, this study which has been made of the needle-working trade has the vocational element as its basis. While recognizing the other three, it is not proposed to discuss them nor to include them as factors in this problem. The purpose of this study may be stated as an attempt to provide instructional material for use in schools where girls are anticipating entrance upon or have already entered the needle-working trade. It is designed, moreover, for a local situation, and can only serve suggestively under any other circumstances.

The local situation was found at Dubuque, Iowa, where the public part-time school was faced with the problem of giving civic and vocational instruction to girls now working for the H. B. Glover Company, manufacturing an extended line of sleepingwear and overalls. In the factory there is also a training organization for assistance to newly employed girls. Mr. Harvey L. Freeland, State Supervisor of Trade and Industrial Education, suggested the benefit which would come through a survey of the problem along some definite lines, and brought the matter to the attention of those concerned with vocational education at Iowa State College. The H. B. Glover Company, directly interested in the part-time school, and

in the prospect of improving its own training school, kindly offered all its facilities for use in making the necessary analysis of the industry.

The survey was made with the assistance of the part-time school teachers and the factory instructors. Officials of the company including foremen and forewomen were highly co-operative, making available all necessary information, and checking the work to ensure its authenticity. Each department was visited and a skeleton draft of the production organization was made with the payroll jobs in each department and the work jobs included in each payroll job. It was necessary, however to make a more complete study of those departments where girls are employed, and this was done partly through conferences with the factory instructors, and partly through direct observation of processes. The conferences were necessary to establish a point of view and create a general concept of the instruction given in making certain garments. When the conferences had accomplished this they had served their purpose, and thereafter the analysis of processes could be made more speedily and accurately by direct observation of the girls at work on the garments. By observation and questioning, a mass of information was obtained regarding garment-making in four departments. Additional information was secured from foremen and forewomen, which has been arranged as a part of this study under general or common instructional material.

While the direct purpose of the survey was to assist in the solution of a local problem, it is felt that it can serve in a suggestive way to other part-time school officers having similar problems in other industries. It will also be serviceable to heads of vestibule schools in the needle trade elsewhere, and may suggest to plant instructors of other industries a way out of some difficulties.

II. METHODS OF PREPARATORY TRAINING

There are two possible agencies for training workers in the semi-skilled employments. The public may provide for it in certain cases where the community value is sufficiently apparent to receive attention from the public school board. It is here that the part-time school can serve as the particular agency in such training. If needlework is sufficiently important in the community enterprise, it is possible to provide special training for girls anticipating employment in garment factories. These girls may be employed in various occupations, but have expressed a desire to learn power machine operating in order to change to an occupation with greater earning capacity. They may already be employed at junior clerical service in a garment factory, and meantime be preparing themselves at part-time school to master the operation of a machine sufficiently well to enter one of the making departments. In either case it is a part-time

preparatory class in power machine operating, and the public school board would be serving the interests of the community directly by meeting the vocational desires of these young people.

The second training agency is what is called the factory vestibule school. It presupposes no preparation in advance of employment in some factory. The girl is hired to operate a sewing machine, and must be prepared to do so. Many factories place these novices on the production floor and train them there. There are several important difficulties in successfully carrying through such a process of training. These may be itemized as follows: (a) learner is overawed by speed and volume of work seen all around; (b) others are wholly engrossed with production so that the learner is very much alone at a time when a personal interest and a common problem is most appreciated; (c) learners are so scattered that personal supervision by the instructor is made less effective; (d) if instruction is a part of the forewoman's duty, the supervision is rendered still less effective because of the duties incident to production. For these and other reasons it is best to segregate learners in a training room until they have acquired sufficient knowledge about the processes and the firm organization to take their place on the production floor as a unit in the plant and with an interest common to those already there.

In the series of Training Bulletins issued by The Training Service of the United States Department of Labor there are four devoted to the garment trade. All of these have a very clear and adequate description of the vestibule school, so that it is not necessary to enlarge this point. The purpose here is rather to provide suggestive material for use by instructors in either a public part-time or a factory vestibule school. A word is necessary as to the organization for instruction. At the factory there is provision of machines, power and material with but little extra expense. Instructors are selected from among the most capable operators who may have at least a liking for the job, and possibly a "knack" of putting across the ideas required in operating a machine. These instructors, however excellent, are seriously handicapped by the fact that they are simply passing on certain skills in much the same way that they themselves were taught them some years ago. They have not learned the new trade of instructing, and are not aware perhaps that they have actually changed trades completely. Executives in the plant have little to offer in the way of suggestion for their interest and effort is in production rather than instruction. Consequently the vestibule school instructor is left to "go it alone," under the impression that because no one can give her any suggestions, she knows as much about it as anyone else and probably more. There are two points at which the vestibule instructor usually breaks down to a degree. The first is the failure to include sufficient teaching material in the outline of what should be taught. Probably there is not even such

an outline in existence. This bulletin is an attempt to set up something in the way of an objective. The second error is the impression that showing and telling is teaching. Remedy for this lies in a study of the art and science of teaching. Instructors must be trained to teach just as operators are trained to manipulate goods in the machine.

In the part-time school one of two policies may be pursued. The instruction given may include both acquiring of skill on power machines, and the imparting of essential auxiliary information related thereto, or it may cover only the general facts about employment in the trade, the auxiliary information of a more general type regarding the materials used, and the story of its production up to the time it comes to this factory as raw material. Unquestionably the former is better since it includes the latter. Such a course of instruction will mean the installation of a number of power sewing machines. The instructor for this part of the work must be familiar with quantity production on such machines, and it is recommended that the school board secure the service of some factory instructor for a limited time each week to give the necessary manipulative instruction. The provision of sewing material must also be arranged. By cooperation with the management of the company from whom the machine instructor comes, it should be possible to arrange for diverting certain parts of lot numbers to the part-time school for use by the instructor, who would be responsible for them in just the same way as she would be when instructing in the factory. The auxiliary instruction may be given by regular part-time instructors who know the factory organization and have learned the personnel and duties which go with each position, together with such information as appears later in this study.

As indicated previously there will be two types of girl taking such part-time instruction. Some are already employed in the garment factory at other employments than machine work, and are looking forward to a change which will be in the way of a promotion. Others are employed at various occupations in the city, or are staying at home, but are anticipating a change of occupation in favor of the garment factory. In an eight-hour period of schooling per week, the time might be divided in the following way:

Power machine operating.....	3 hours
Auxiliary information.....	1 hour
General improvement.....	4 hours

If twelve girls desired to learn power operating, they could be accommodated with a unit of six machines if formed into two groups, A and B. Half of the eight hours would be required to segregate these girls for special instruction, while the other four of general part-time instruction would be spent in regular classes. The two groups would meet together for the auxiliary trade instruction, but

would get their machine operating at a different time. A suggested schedule follows:

First Half Day

Group A—Machine Operating.....	3 hours
Group A—General Work.....	1 hour
Group B—General Work.....	4 hours

Second Half Day

Group A—General Work.....	3 hours
Group B—Machine Operating.....	3 hours
Groups A & B—Related Instruction.....	1 hour

This would mean that a factory instructor would be required for two half-days of three hours each.

III. VOCATIONAL TEACHING OBJECTIVES

Before any body of material can be set up for instructional purposes, either in a part-time or a vestibule school, it is necessary to have very clearly defined aims as to what is to be done for those trained. Here are some which might be adopted.

1. To train the learner as a high speed operator of some particular machine doing a special operation.
2. To train the learner as a skilled operator of some particular machine doing a number of operations.
3. To train the learner as an intelligent, skilled employee giving full time to operation of some machine.
4. To train the learner as an intelligent, skilled employee giving full time to variety work on some one or more machines.

These are each worth some careful thought so that they may be evaluated, for on the choice of objective hangs a great deal of the success attained, provided its requirements are adequately met. It is safe to predicate that the first objective is more frequently chosen than any of the others, or that the methods adopted and teaching content used indicate such to be the result where probably no aim had even been formulated. It will be noted that three ideas dominate, namely, high speed operator, machine, and one operation. The instructor has in mind the minimum time and effort to approximate the aim, and considers the essential elements a machine and an operator to feed it with material. It presupposes an automaton whose only activity is physical like the machine.

The second objective is an improvement upon the first in that it enlarges the physical effort to a degree, providing a range of differentiated motions which themselves go through a cycle. Here again the elements are a machine and its attendant.

The fundamental error in the assumption in both cases is that the individual is merely physical. Man is a product of Mind, not of

matter, and as such he is expressing ideas which are more real to him than any material things, because they affect his conduct with ten-fold more force than anything else. Man fights for an idea and strikes for certain principles which he calls fair play, justice, equality, etc. So that to assume that an operator who is trained to attend a machine will do that and nothing more is a fallacy. She thinks, and unless her thoughts are wisely directed they may assume improper relationships and induce wrong conclusions. Fancies arise in lieu of facts, and seem as real as the true. Had the training objective included ideas on industrial relationships, there would be much better satisfaction and increased earning power on the part of each learner.

The third statement of an objective brings in the new element that the learner is an employee as well as a machine attendant. That is, she has human relationships with other employees, who as a whole form the personnel of the force from management down. It is an industrial team, not a collection of persons. They are harnessed together by an organization which demands that each unit pull its share. The learner in this case must not only be skilled, but also intelligent along such lines as will be indicated later.

The fourth aim differs from the third in that the learner is trained with advancement to executive positions in view. It may not be purposely entered at the beginning. That is, a learner might have been trained according to the third aim, but manifests ability which would make it advisable to train for the fourth. She would then be taken off the production floor and placed on a time basis while being trained to do a variety of work, and have an adequate presentation of the problems related to that work.

It is possible that management officials will feel that there is no time for training in anything else than the bare bones of the processes; that it will cost too much to follow what looks to be mere idealism. Yet these same officers are spending far more in adjusting differences, listening to grievance committees, hiring and training for an abnormal labor turnover than would meet the additional cost of more effective initial training. Ignorance is the breeding ground for a large part of the labor dissatisfaction, and when this has been opened up at the beginning, much grief will have been eliminated.

IV. GENERAL INSTRUCTIONAL CONTENT

With the purpose of assisting instructors who are faced with the responsibility of giving instruction preparatory to employment in the garment trade, the following outlines have been prepared. They deal with a local situation, and have been itemized from particular data, so that they can serve as a whole only for the schools and factory in this particular city. Elsewhere the material can only be

a suggestion of what might be prepared under parallel circumstances.

Under this heading will be included those subjects which should be taken up with every learner who is enrolled, regardless of what place she is to occupy in the factory or office. Every clerk should have a day or two in the vestibule school to get acquainted with the local organization, learn who its officers are, catch its spirit, get a good acquaintance with the factory program, and join the team in purpose as well as in letter. There is not any suggestion as to the order in which it is to be discussed because it is all classed as auxiliary information, and as such is simply imparted rather than taught. Instructors will be guided by the situation in hand when selecting a sequence of topics. The numerals attached to the topics are therefore only for identification purposes.

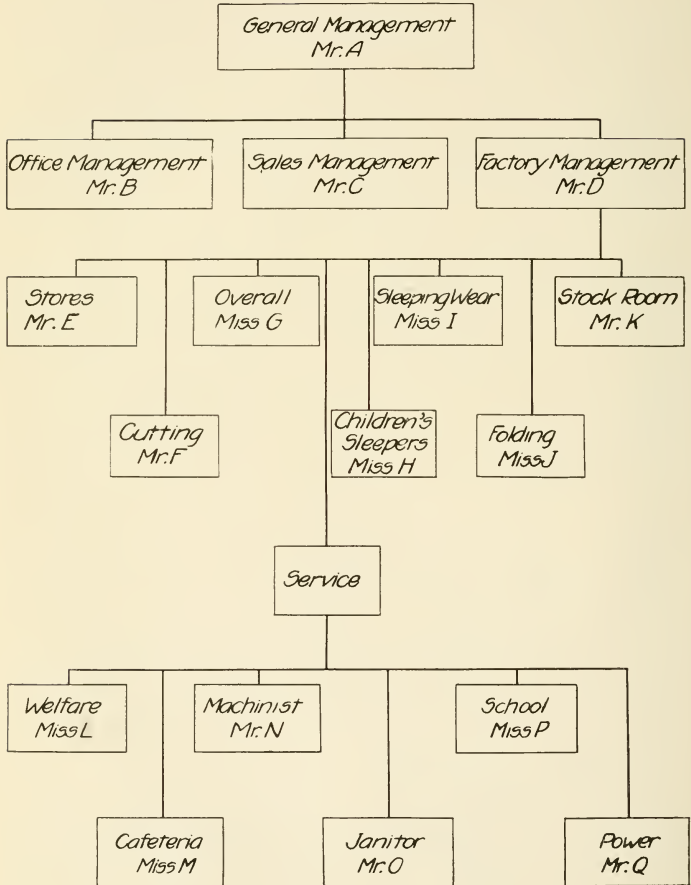
Topical Outline

1. The Local Company
 - a. Formed—years ago.
 - b. Purpose (enlarge present situation).
 - c. Set up standard of excellence (enlarge present standard).
 - d. Company organization and duties of each head (see chart, page 10).
 - e. Function of each department in factory proper.
 - f. Learner is introduced personally to each official with whom she will have relations.
2. Manufacturing costs
 - a. Table showing relation of costs

Material	Labor	Factory	General	Profit
Prime				
Shop cost				
Total cost				
Selling price				

- b. Prime costs include :
 - (1) Direct material going into product for sale.
 - (2) Indirect material such as coal, oil, water, gas, boxes, crates, factory office supplies.
 - (3) Direct labor upon product made for sale.
 - (4) Indirect labor including entire service force.
- c. Factory costs include :
 - (1) All prime costs.
 - (2) Factory supervision, as foremen, foreladies, superintendents.
 - (3) Factory office labor, as desk girls, label markers, clerks.
 - (4) Interest on money invested in buildings, or rent for same.

COMPANY ORGANIZATION



- (5) Interest on money invested in machines, or rent for same.
 - (6) Taxes, insurance and repairs.
 - (7) All spoilage and waste of goods.
 - (8) All designing and experiments.
 - (9) Replacement of all machines as they become useless (depreciation).
 - d. Total costs include:
 - (1) All prime costs.
 - (2) All factory costs.
 - (3) Salaries of general office and sales force.
 - (4) Expense of selling other than salary, as travel, etc.
 - (5) Rent, taxes, insurance and maintenance of general office.
 - e. All costs over that of direct material and labor are called overhead costs. A failure to see relative values is found in assuming that the making cost is the only one. There are many others which must be added to this, as shown above, and when all are included it will be found that the selling price of the garment exceeds the total production cost by but a few cents. Get exact company figures to illustrate this in a series of examples.
 - f. Profit means the balance or surplus which remains of the selling price after all costs have been paid. It is a rising and falling sum depending upon the amount of goods sold, state of the markets and amount of competition. At times there is no profit at all, and sometimes a real loss must be sustained.
3. Markets and Competition
- a. Manufacturers can only sell when the public wants to buy. This want establishes a market. Business market depends absolutely on the wants of the people.
 - b. When wants are made known there is a bid by two or more manufacturing firms to get the business. This bidding is called competition. It means cutting the selling price to the limit.
 - c. Price cutting means eliminating
 - (1) Unnecessary or perhaps all profit.
 - (2) Unnecessary overhead costs. (Local plant examples.)
 - (3) Unnecessary factory costs. (Local plant examples.)
 - d. Necessary costs cannot be reduced. They include
 - (1) Lowest buying cost of material.
 - (2) Lowest fair wage for labor, supervision, office and selling force.
 - e. Fair wages, hours and conditions mean willingness and teamwork, resulting in least amount of spoilage and waste, and largest output of product.

- f. A sale order at a slightly lower price and more frequently made is better than a sale order at a higher price and less frequently made. (Local plant examples.) No sales mean no work at our factory.
- 4. Capital Turnover
 - a. Two meanings are given to the term.
 - (1) Volume of business transacted in the year. Example, with an investment of \$60,000, \$60,000 worth of material was bought, made and sold. One turnover was made.
 - (2) If the \$60,000 total was reached by having only \$20,000 available cash, this being used to purchase, make and sell, then again purchase, make and sell, and again a third time, then the company is said to have made three turnovers in the year on a \$20,000 investment.
 - b. Company having two turnovers in a year can sell at 3% profit, and earn as much as it would with one turnover selling at 6% profit. It is therefore better for public, company and employees if turnovers can be made as frequently as possible on a small investment. Show why. Get local data for use on this topic, and enlarge as much as needed.

V. COMMON FACTORY KNOWLEDGE

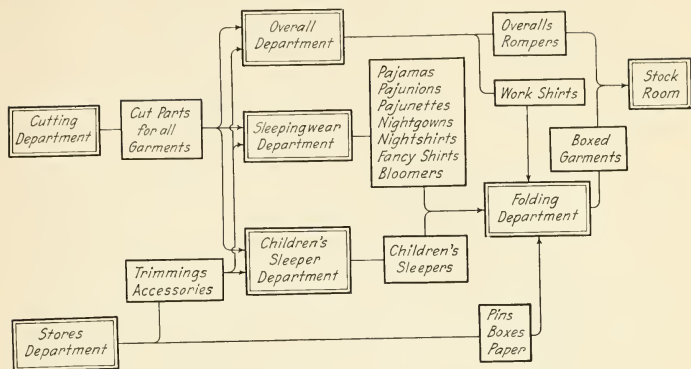
This auxiliary information is given in addition to the preceding material to all employees who are to enter the factory. It is somewhat more specific in character so that the workers have an immediate knowledge which will not only serve them, but will help them know their place in the industrial team and fill it intelligently and satisfactorily to themselves.

There is also a body of information which is required by every machine operator, irrespective of the particular type of machine which she may be operating. All special descriptions of machines for example will appear in the detailed analysis of that part of the production duty in which such machines are used. All information which would otherwise have to be repeated with each machine has been assembled under this heading for convenience. Likewise with materials used, where all who are working with flannels, or cambrics, or pongees, would need to know the properties of each of these in order to handle them intelligently, it saves effort and time to cover this common subject matter once only.

Topical Outline

1. The local organization for production:
 - Make a trip over the factory and point out main features, then discuss more fully in school. Study the following chart.

CHART OF PRODUCTION ORGANIZATION



The following description of the organization will add further to the understanding of the chart.

a. Purchasing Agent

Material or stock is bought by (name), who is part of the office staff. Goods on arrival are sent to the stores department for record and distribution as needed.

b. Planning and Designing Department

Designs for garments are worked out in a division of the general office. When a design is approved it is then detailed onto a descriptive sheet showing quantities, kinds and sizes of various piece-goods, trimmings, buttons, etc., required. An order number or lot number is assigned to it, and the descriptive sheet is then sent to the store room, along with a master work chart and cutting ticket. Get these and discuss samples fully.

c. Stores Department

- (1) Requisitions materials.
- (2) Receives and enters record of all materials.
- (3) Piece-goods (yardage) kept in stock room distinct from small stores.
- (4) On receipt of order from planning department,
 - (a) Enters order or lot number on books.
 - (b) Sends master work chart and cutting ticket with piece-goods to cutting department.
 - (c) Retains descriptive sheet.
 - (d) Makes out size ticket for the lot and sends them to cutting room.

(e) Removes from store by perpetual inventory system (describe) all trimmings, etc., indicated on (c) and places them in a box marked with the lot number. This goes to sewing department on request of desk girl when needed.

(f) Requisition boxes or cartons for packing the order when it reaches folding department.

d. Cutting Department

This is the department in which production actually begins. The large room is filled with long tables on which whole webs of piece goods can be laid up one upon another until two or three inches deep. A set of patterns is laid upon the lays and marked, then the cutters use the cutting machine to separate all the parts, following the lines very carefully. These parts are assembled into bundles of twenty-four complete garments, and the necessary cut trimmings and size labels which go with them. The tied bundles are ticketed with lot number and sent to the sewing room in wheeled trucks.

A picture of the department is shown in the following table. Payroll job means the name under which a given worker is identified. Sometimes this name indicates exactly what the employee works at, but in many cases it does not, so the names of all the jobs each employee works at are placed opposite the payroll job to make clear just what duties the payroll job includes.

Cutting Department

No.	Payroll Job	Work Jobs
1	Layer	Sort yardage, sort colors, check quantities, lay up.
2	Marker	Select patterns according to master work chart, check yardage, mark lays.
3	Cutter	Cut lays with machine, trim lays with short knife.
4	Assembler (Trimmer)	Split into 24's, put in labels, put in cut trimming, etc., attach job ticket.
5	Matcher (Not a regular job)	Match stripes on parts of fancy shirts before cutter cuts to pattern line.
6	Transfer boy	Distribute bundles to sewing departments.

e. Overall Department

For description see introduction to analysis of this department on page 29.

f. Sleepingwear Department

For description see introduction to analysis of this department on pages 42 and 56.

g. Children's Sleeper Department

For description see introduction to analysis of this department on page 65.

h. Folding Department

For description see introduction to analysis of this department on page 74.

i. Machinist Department

While this department is not directly concerned with production, because it does not handle the goods, yet its indirect relationship is very intimate because the service rendered is in care of the machines. A small shop is provided where machines can be taken down and repaired, or adjustments made. The following chart indicates the service rendered.

No.	Payroll Job	Work Jobs
1	Machinist	Take down machines, repair parts, replace parts, make adjustments, install machines.
2	Belt boy	Repair belts, oil shafting and motors, assist on repair work, adjust lights, minor service jobs.

j. Stock Room, also Shipping Room

This department receives the finished goods in boxes, cartons and parcels from the overall and folding departments. The overalls are not wrapped, being simply tied in dozens. Goods are assembled according to orders received from the office and prepared for shipping. A chart of the department shows the following duties:

No.	Payroll Job	Work Jobs
1	Stock Clerk	Receive goods from factory, place them in stock room, pick out and prepare order for the shipping room.
2	Checker	Check order sheet with goods in shipping room.
3	Packer	Wrap parcels and tie them, fill cases with cartons or wrapped bundles.
4	Receiving Clerk	Record weights and numbers of cases.
5	Shipping Clerk	Record shipments.
6	Helper	Open empty cases, nail up cases, brush on addresses, load wagons.

2. Materials used in factory production

a. Denim

- (1) Used for overalls, work coats, rompers.
- (2) Bought in bales of 1000 yards each, the yardage coming in pieces of 50 to 60 yards each in length. Width, 28 inches.
- (3) Described in catalog as two-twenty, two-forty, two-sixty or three yard denim, meaning heavy, medium and light weight goods respectively, and referring to fact that there are 2.20 yards, 2.40 yards, etc., to a pound of cloth.
- (4) Customary in factory to refer to goods by lot number to which the special kind has been assigned in descriptive sheet, as N-102, O-263, P-3558, etc.
- (5) Manufacturers will guarantee only one bale of vat-dyed piece-goods to be uniform in color, hence when lot numbers run several bales it becomes necessary for operator to match colors, to see that each overall suit is same shade throughout.

- (6) Some denims are washed in a solution of iron, which when dried out leaves the iron in the cloth to make it heavier. This iron is hard on sewing machine needles, dulling them rapidly. Remedy is to soap needle or use as fine a size of needle as will stand up against the drive.
- (7) Kinds used are plain blue, plain white, plain khaki, blue and white stripes.
- (8) Close weave makes the goods somewhat stiff and heavy to handle.
- (9) Length of stitch, 10 to 14 to the inch.
- b. Flannelette
 - (1) Used for winter sleeping wear for men, women and children.
 - (2) Cases contain 1500 to 2000 yards, 50 to 60 yards to a piece. Width, 36 inches.
 - (3) Woven and napped on both sides so that there is no right and wrong side to the goods.
 - (4) Variety is secured by stripes of various widths and spaces. Stripes may be one color or composed of several narrow colored stripes together, forming a larger stripe.
 - (5) Composite stripes are two kinds.
 - (a) Balanced, in which there is uniform arrangement of the narrow stripes on each side of a center line.
 - (b) "One way" patterns, in which there is no symmetrical arrangement.
 - (6) In the latter case parts of garments requiring to be matched, like pocket pieces, can only be placed "one way" when attached. Balanced patterns are preferred.
 - (7) Softness of the weave allows the sewing machine thread to sink easily into the goods, so that length of stitch can be 14 to the inch and still do a good piece of work. Cottons and harder goods require 16-18 stitches to the inch.
 - (8) Much lint gathers on the machine parts when using flannelette, requiring more frequent cleaning.
- c. Information similar to the above should be secured and given on the following: prints, cambries, muslins, pongees, percales, nainsooks, jacquards, silks, any other piece goods made up into garments.
- d. Sundry materials in store room
 - (1) Folding Department
 - Pins are bought in bulk in 5-lb. boxes, 20 boxes to case.

(2) Overall Department

- (a) Patent buttons. Bought in great gross (12 gross) packages, 25 packages to the case. Buttons and tacks in separate packages. Made in japanned, brass, or nickel finish. Sizes measured by "lines," a line being one-fortieth of an inch. Two sizes, usually 22-line and 27-line, used on each garment.
- (b) Buckles, loops, snap loops, slides. Bought by double-gross or in barrel lots, bulk; made in brass and nickel.
- (c) Elastic webbing. Bought per yard by 1000 yards, in 50-yard rolls. Marked to order with firm name and space marks for cutting into lengths. Widths used are $\frac{3}{4}$ ", 1", $1\frac{1}{8}$ ", $1\frac{3}{8}$ ", $1\frac{3}{4}$ ". Used in straps or suspenders. Cut into bundle lengths of one dozen pieces by store clerk, and into separate pieces by operator.
- (d) Labels. Paper and cloth labels are printed to order with firm trademark and lot number. Sizes are stamped on labels with rubber stamps before being sent to cutting room.
- (e) Thread. White, black, olive drab and canary yellow colors used. Size of thread indicated by number, and hyphenated with it the number of cords in the twist, 24-3, 36-3, etc. Eight hundred and forty yards of thread of any size is arbitrarily called a "hank." If 30 hanks of a particular size of thread weigh one pound, then that size is said to be No. 30 thread, etc. This is also called the "count." Thread may be glazed (starch) or soft. Top thread (needle) is 30-3, soft, and comes in 9,600-yard spools. Spools cost 10 cents extra over cones, but expense is saved in knotting trouble as it comes off on the machine. Bottom thread (bobbin or looper) is 36-3, soft, and comes in 12,000-yard cardboard cones. The way it is wound on does not cause trouble in machine and saves expense for spools. Buttonhole thread is 56-3, glazed, for the Reece machine, and 30-3, soft, for Singer machine; colors black and bronze-brown. Buttonhole cord is a heavy black 3-cord which is sewn in around edge of hole for reinforcement purpose.

(3) Sleeping wear and children's sleeper departments

- (a) Labels. Bought in 500,000 lots, 1000 labels to the roll. Trademark and firm name printed on them.
- (b) Size tabs. Bought locally and printed in 20,000 or 30,000 lots with the sizes and classes such as "men's," ladies', boy's, baby's, etc. Tabs are stuck under edge of label when sewn to garment.
- (c) Thread. Top is 60-3 and 80-3, white, soft, on spools. Bottom is 70-3 and 80-3, white, soft, on cones. Unbleached white is cheaper and stronger than bleached, and is used on flannelette where possible. Bleached must be used on cambries and muslins. Colored cotton or silk thread to match is used on all garments of pongee, silk, etc. Buttonhole thread is 40-6, white, on top and 70-6, white, on bottom.
- (d) Buttons. Freshwater native pearl buttons are white opalescent. Japanese pearl buttons are yellow semi-transparent and higher grade buttons in every respect, and yet can be purchased at almost same price because of cheaper labor. Two-thirds of freshwater are used for the bulk of garments. The higher priced garments have Japanese buttons. Ocean pearl buttons, highest grade of American make, are used exclusively on shirts. Sizes used vary with position on garment, being 18-line, 20, 22, 24, 28 and 30-line diameters.
- (e) Trimmings

Mercerized crochet cotton, Nos. 3 (coarse), 11 and 20, all 2-cord, is bought in bulk in $\frac{1}{2}$ -lb. cones in white and all desired colors. Smaller quantities bought locally in balls. Used for fancy stitching on garments, like briar, wave, hem and shell stitching. Explain process and purpose of mercerizing yarn.

Feather stitch braid (silk thread designs in white and colors on cotton braid $\frac{3}{16}$ " to $\frac{3}{4}$ " wide) is frequently sewn on garments. Woven braids in two forms, bought bulk in gross yards on spools.

Rik-rak is a zig-zag weave of silk thread

over a heavy straight cotton cord, and is sewn direct onto garments. Colors as desired.

Edging and plain braids in white and colors for sewing along edges of garments.

Middy laces for pajunions and pajunettes. Ribbons, plain and fancy, white and colored, for knots, bows, etc.

Elastic for bottoms of pajunettes and bloomers, with straight lining for covering same. Bought in 2-gross yard spools.

Bindings, straight and bias cotton, for doubling over edges and sewing to garment. Bias binding is made by cutting piece-goods at an angle of 45 degrees in widths of about two feet and sewing the selvages end to end without overlapping. Special machine staggers the needle alternately across the joined edges. The bias strip is then rolled on a tube and sawn off into $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1", etc., rolls. Edges are raw.

Fringe is a narrow cotton tape with silk or cotton fringe along one edge, bought in half-gross yards on a card. Used for sewing to ends of pajama girdles. Is cut up by operator as needed.

Loops (frogs) in white and colors are bought in gross-lots for sewing on buttonhole positions on pajama jackets.

3. Equipment

a. Instruction about construction, operation and care of machines

(1) Principal parts of machine are:

- (a) Head, the sewing part, fastened to table top.
- (b) Transmitter, the power link, fastened to under side of table.
- (c) Control system, the foot treadles or knee lifts which start and stop action.
- (d) Thread standard, from floor or table top, holding two, four or six spools according to machine.

(2) Principal parts of the head are:

- (a) Base, the iron casting supporting all machinery and attachments. Parts called bed, column and arm. Beds may be flat (regular type) or special (shaped to do special work)

as on buttonhole, felling or tacking machines.

- (b) Main Shaft and Handwheel. The shaft lies in the arm, with handwheel for hand control and belt groove at right or back. On the shaft are all needed cams to change revolving motion into reciprocating motion. One cam operates a link down through the column to the underside of bed, controlling feed dog and shuttle or looper. Another cam operates the needle. Other devices on special machines may be operated by cams or gears.
- (c) Presser foot is a smooth shoe which is attached to the bottom end of an upright sliding bar just behind the needle. A spring presses this shoe downwards to keep the cloth against the surface of the bed. The needle usually is so placed as to work through an opening in the foot. It is lifted to insert cloth by a link or rod and chain to either a treadle or a knee-lift.
- (d) Feed dog is the serrated moving part which comes up through the bed beneath the presser foot far enough to grip the cloth against the foot and draw it back after the needle has been withdrawn. Its motion is compound reciprocating, first rising, second moving backward, third dropping, fourth moving forward. The feed dog controls the length of stitch, as its back and forward motion can be shortened or lengthened by a stitch regulator.
- (e) Stitch regulator is an adjustment which alters the proportion of the link motion operating the feed dog so that it moves through a smaller or greater space. In some machines the regulator is placed on the end of the main shaft outside the handwheel, and in others on the front of the column just near the bed.
- (f) Tensions are regulating devices for controlling the "pull" or tautness of the thread, in which the thread passes between two plates or discs which have pressure upon them by spring and adjusting nut. One is on the

arm for the top thread and the other under the bed for the bottom thread.

- (g) Take-ups are the moving eyelets through which the thread must pass, for the purpose first, of drawing thread through the tension as the needle descends; second of slacking off thread for the looping operation indicated by the slight backing up of the needle; and third, to take up the thread taut again as the needle rises. One take-up is on the arm, and the other beneath the bed. Motions of both tally exactly with that of the needle. There is no lower take-up on a shuttle machine, that action being provided in the motion of the shuttle itself.
- (h) Looper and shuttle. Two distinct methods of feeding the lower thread to the needle. The shuttle is a revolving or reciprocating part containing a bobbin or spool of thread, and so timed as to pass its point or nose through the loop of the upper thread when formed by the partial lowering of the needle. Thread is wound onto the bobbins and put into the shuttle as required. In the looper system the lower thread comes direct from the spool to the lower tension, through the take-up and into the looper, which passes it behind the needle thread in exactly the same manner as the upper thread came through the upper series. Further description of these mechanisms is impossible without the machine to demonstrate.
- (i) Bobbin winders on the shuttle machines are fastened to the table so as to receive motion by friction against the handwheel. The thread passes through a tension onto a bobbin, which when filled automatically throws the winder out of contact with the handwheel.
- (j) Multiple-needle bar. Some machines sew two and three rows of stitches, by having that many needles in the bar. In these machines the looper system is used beneath the bed, so that either two, four, or six spools of thread are fed directly into the needle according as it is a one, two or three-needle machine.

(3) Transmitter

- (a) Purpose to transfer power from the line shaft and control its use or non-use. It is simply a jack shaft on hangers under the table and guarded at all danger points.
- (b) Driven Pulley. Either a flat or grooved belt pulley connected with the line shaft by a 1" flat or a round leather belt, and running loose on the jack shaft. It runs continuously with the line shaft.
- (c) Driving Wheel. A grooved wheel fastened to the jack shaft and belted by round leather through holes in the table to the handwheel on the head. It stands still when machine is out of action.
- (d) Clutch and brake. By special device on side of the two wheels, called a clutch, the two can be locked together so as to run as one wheel. Momentum of the machine is checked so as to stop when the clutch is released by immediate application of a brake. Loosening the clutch applies the brake at the same time, and vice versa.
- (e) Speed ratios. Machines are constructed to run at certain capacities, usually 2500 to 3500 stitches per minute of continuous running, and to maintain that speed always while actually sewing. With a mainshaft running at a certain known speed, and the machine speed known, only a certain size for each of the two pulleys of the transmitter will give the right speed. Two-step transmitters are sometimes made so that machines may run at different speeds according to the goods being put through. In this case the line shaft and driven pulley have each two steps (called a two-step cone) on which the belt may be placed.

(4) Control system

- (a) Transmitter treadle. A foot tread linked to the clutch and brake of the transmitter. Pressure of the foot releases the brake and cuts in the clutch. Removal of the pressure reverses the action.
- (b) Presser foot control. Already described under presser foot. Either a foot lift or a knee lift.

- (c) All machines have special controls and adjustments which can only be taught by demonstration on those machines at which the learner is to be employed.
- (5) Attachments
- (a) Folders. Very many forms for special duty, and only describable when actual part is present. They are made of thin sheet metal formed in such a way as to lead the edge of the cloth under the needle in some arranged manner. Single scroll folders turn only one edge of cloth. Double scroll folders work two edges together so as to form seams of various kinds and sizes. Double scrolls may be either right or left, that is, make upper side of seam face right or left of the needle. Fastened as a rule to bed just in front of the presser foot. Vary in weight and strength according to goods to be handled. Must be placed "fair" so that seam or hem is correctly under the needle. Must be in some cases adjusted for runs of thick and thin goods.
 - (b) Combination presser foot and folder. Used for pleating work in shirts.
 - (c) Gatherer. Works in combination with a double folder, where one part of garment must be gathered in as it is sewn between two other hemmed edges. Used alone on any piece of goods. Operates by lever attached to bottom of needle bar.
 - (d) Numerous attachments for special purposes described only to those who will operate them.
- (6) Needles
- (a) Needles are marked by numbers according to size, ranging from No. 2 (smallest) to No. 8 for garment making purposes. The size of

Needle Number	Thread Sizes	
	Cotton	Silk
2	150-100	000-00
2½	100-90	00
3	90-80	0
3½	80-70	A
4	70-60	A
4½	60-50	B
5	50-40	C
6	40-30	C
7	30-24	D
8	24-16	E

the eye has a distinct ratio to diameter of the needle, hence certain sizes of needles are best used with certain sizes of thread. A table is given to indicate this relation.

- (b) The method of setting needles in the machines is the same in principle, but may vary somewhat in application on different machines. A set screw is tightened against the shank of the needle after it is placed in a hole or a groove in the needle-bar. Directions which go with the machine indicate method of placing the needle at the right height to have the eye make the loop in correct place for the shuttle point or looper to pass through it.
 - (c) Any facts regarding essential shape or size of the needle for specific purposes should be taught.
 - (d) Method of threading needle is a point for careful instruction. It includes how to shape end of the thread, how to hold thread properly, best method of passing it into eye and drawing through, best position of eye and light to strike the eye "fair."
- (7) Line Shaft
- Placed beneath a double row of machine tables and serving two rows of machines. Motor drive connected usually at one end of line shaft. Safety precautions.
- (8) Threading machine
- (a) Upper thread. Each learner must be taught to thread her individual machine. The fundamental things about threading are that thread goes first through a guide, second through a tension, third through a take-up, and fourth through guides to needle.
 - (b) Lower thread. In general, take out throat plate, remove empty bobbin, place full bobbin and close shuttle, draw thread through tension, turn hand wheel till needle brings up lower thread, replace throat plate.
- (9) Feeding
- (a) Underply must always be retarded and overply allowed to run through freely. Reason is that the feed dog pulls the ply next to it, while the presser foot restrains the upper ply giving a tendency to slide and pucker.

Only exception to this is when the underply is bias goods, in which case it should be allowed to run through freely.

- (b) Similar instruction, with intelligent reasons in all cases, on method of operating when starting seam, turning corners, removing work, tacking with presser foot lifted, etc.

(10) Oiling Machine

All places requiring oil should be located and method of getting to them with oil-can demonstrated. The grease cup on the transmitter is also to be explained. Frequency of oiling is determined by the need, and once established, every operator should conform to the schedule. All parts do not require oil with the same frequency, so that judgment as to when and how much oil to apply is an essential teaching point. Garments may be ruined by spattering, and machines may be ruined by burnt bearings. There is a proper condition which must be learned and maintained.

(11) Cleaning machine

The machine is the operator's friend. When treated rightly it responds by increased earnings. Neglect it and it cannot serve so well. If factory rules require that machines be given a periodic cleaning, the ruling has been made in the best interests of all. It should be observed only as the least that might be done. Lint, dust, grit, excess and used oil gather and reduce earning power. Two minutes spent in cleaning occasionally will return several times that in earnings. Learners should be taught how to clean, and required to clean their school machine, say daily, as a preliminary to beginning work. Each cleaning should be inspected and graded.

(12) Trouble Shooting

- (a) Thread breaks repeatedly. Look for rough needle hole in throat plate, worn eye in needle, tension too tight or grooved, uneven size of thread, knots, snarls, etc. Remedy for each case when found.
- (b) Skip stitches. Look for cause of looper or shuttle failing to get through loop made by needle, or maybe looper tension is too slack, allowing more thread to come through than lower take-up can control. Remedy for cause when located.

- (c) Similar instruction for all forms of trouble which may arise.
- b. Cafeteria and Recreation Rooms
- (1) Necessary description and rules as to its use.
4. Routing System
- a. General plan
- (1) Route of material from cutting room to top floor thence by stages back to ground floor. Banks of similar machines installed on tables in number sufficient to get balanced production. Stationary bins at ends of machine tables and close to examining tables for storing bundles between processes. Counter between tables and bins at which desk girls make records of bundles handled into and out of bins, with record of operators and processes.
- b. Methods of transportation
- (1) Trucks with racks or boxes for bringing stock to and from cutting room, and finally to stock room as finished product.
- (2) Shutes for passage from floor to floor.
- (3) Bundles carried by individuals to and from machines, examining tables, folding tables, boxing tables, etc.
5. Card and Ticket Systems
- All lots and bundles are distinguished by cards bearing descriptive numbers, and work cards for the payroll number of each operator performing certain productive tasks on the goods. Necessary instruction regarding these cards must be included here, samples of same being prepared for demonstration, and practice afforded in filling them out.
6. Employment and training
- a. All beginners must be trained to produce at a profit to themselves. From the first they should know that they are not profitable workers for themselves, and a distinct loss to the company. The piece rate earnings represent their real value to themselves and the company. The cost of training and any other wages than piece rates earned are therefore given to them without any returned value.
- b. The company considers that a girl cannot learn to earn profitably to herself at the piece rates under less than seven weeks, and in order to be fair it pays a bonus or free gift in addition to the amount earned. The schedule of wages paid during the training period is as follows:

Week	Piece rate earnings	Bonus
1st	Record of bundles sewn and	\$7.00
2nd	Record of bundles sewn and	6.00
3rd	Record of bundles sewn and	5.00
4th	Record of bundles sewn and	4.00

5th.....	Record of bundles sewn and.....	3.00
6th.....	Record of bundles sewn and.....	2.00
7th.....	Record of bundles sewn and.....	1.00
8th.....	Record of bundles sewn and.....	none

Get actual figures of several cases to show constancy of the sum.

- c. Piece rate system is established to make it possible for girls to earn according to their skill. By it a certain price is set for doing a piece or unit or perhaps a dozen pieces. This price is established in as fair a manner as can be found. Two methods are used in setting the rate, each of which is intended to find the average speed of production and to set opposite that average a fair wage.

(1) Experienced girls picked at random (say six) are set to work upon bundles of the same kind, and a record of the time of each girl is kept. This trial is repeated several times (say four) and the time of each girl is kept. The time of the twenty-four records is then added and a fair wage set for the time required to make twenty-four bundles. The piece rate or rate per dozen would be one-forty-eighth of this amount.

Examples of these should be worked out as problems with actual data to show how it is done. Knowledge satisfies.

(2) A skilled girl is put at the new work on a time basis. The amount of work which she does is considered to be 80% of what she will do when she gets up to her full speed. This amount which she has done is taken as the amount required to earn the wage for that time. That is, the normal rate is set at $\frac{4}{5}$ of a high speed day's work for a day's pay. The incentive will be to earn more than the day's pay by doing better than $\frac{4}{5}$ of a day's work.

Examples are needed to make clear how this method works out in actual practice.

- d. Relation of piece rate to turnover

It is essential that employees get clearly in mind that quantity production affects the making cost per unit in a way that is frequently forgotten or neglected. If a company invests \$150,000 in a factory to make garments and the turnover in a year is 100,000 dozen, it has to figure very closely on the making cost. An item in the price even as small as one cent per garment means \$12,000 difference in the making cost for the year. If the company had been making 6% on its investment and had to absorb such an amount it would mean that the 6% would be wiped out and a 2% loss on the year's business would

take its place. Hence the rates have to be considered carefully for $\frac{1}{8}$ cents here and $\frac{1}{4}$ cent there per garment. A series of questions taken from actual rates and with the company's actual invested capital should be given to drive this point home.

e. Factory rules

Every employee is required to conform to a number of regulations which have been put into effect from time to time as need arose. They were not made up arbitrarily at one time, and enforced just for the purpose of showing a desire to rule things. Every rule has a reason, and each employee should be informed before going into actual production what rules there are, and have a reason given for the existence of each rule. Furnish a printed or mimeographed copy for each employee, but do more than hand over a copy. Teach the reasons.

There is also the matter of courtesy and general factory etiquette. Rules do not cover everything, and there is much which is left to the judgment and good sense of every employee in regard to relations with others. Many local examples of desirable conduct should be collected and discussed with every employee.

f. Safety and shop hygiene

Aside from such rules as have been made governing safety, it is necessary to give some training in first aid and in general habits of careful action. There should be fire drill for the entire force occasionally, and every new employee needs instruction on points connected with such drill. Some of this instruction will be given when instructing about use of the machines, but there is also need for some time being given to formal discussion of principles of safety as applied in the particular plant.

g. Upgrading and promotion

Provision should be made for training girls provided they show ability and ambition to work up in the service of the company. A promotional schedule for such training ought to be worked out and the objective kept clearly in mind by foreladies, instructors, management and the candidate herself. Systematic preparation for supervisory positions will surely pay for effort expended in this way.

h. State and Federal laws governing safety, employment, workmen's compensation, housing, etc.

i. Interpretation of graphs and charts showing production records of quantity, perfects and imperfects, and other types.

VI. DETAILED ANALYSIS OF CERTAIN DEPARTMENTS

Elsewhere it was stated that machine operators should be familiar with the construction of a garment from first to last—not in the sense of being able to make it necessarily, but so that her own part of the process may be properly located together with its significance and relation to those coming before and after. An analysis has been made of those departments where girls are employed so that these details might be available. The operations are described in such a way as might be called a Standard Operation Sheet, though that was not the purpose. They describe operations as they are now performed. This analysis meets two needs, first, as indicated above; and second, to provide a basis for more thorough instruction on specific operations by noting points which might otherwise escape attention.

In this study there is no repetition of data which is general enough to appear in Section V. In any job where such information is required, but is not peculiar to this job alone, the fact is inferred by the expression, “nothing special” or “nothing additional.”

Overall Department

Three types of overalls are made, namely the pant overall, the bib overall, and the one-piece overall. The pant overall comes only to the waist line. The bib overall is waist high at the back, but has a bib covering the chest. Usually no jacket is worn with this garment, but it may be worn. The one-piece overall is a continuous garment, buttoning from neck to crotch.

The making of a complete bib overall may be described by steps as follows:

No.	Payroll Job	Work Jobs
1	Pocket girl	Sew on hip and rule pockets.
2	First part girl	Hem side facings, put on seat-pieces, make and sew in front swing pockets, sew in fly, hem button side.
3	Seamer	Join backs together, join fronts and backs together at outside seams, join halves of bib together.
4	Second part girl	Hem bib, make and sew on bib-pocket, join fronts together, join bib to front, sew on backband, tack outside seams.
5	Feller	Join fronts and backs together at inside seams.
6	Hemmer	Hem bottoms of legs.
7	Examiner	Examine all previous workmanship, check for defects in goods.
8	Buttonholer	Make fly (for first part girl), make buttonholes in strap tabs, make side opening buttonholes, make buttonhole for watch chain.
9	Marker	Mark for buttons.
10	Button tacker	Put on patent buttons.
11	Strap maker	Make suspenders or straps.
12	Buckler	Put slides and loops on straps.
13	Sorter	Sort all overalls by sizes, tie dozens after folding, pack in truck for stock room.
14	Folder	Put straps on bib, fold, stack in dozens of uniform size.

The overalls to be made up come from the cutting room in bundles of twenty-fours, each bundle having in it all the parts which are

to be sewn together to make twenty-four complete overalls. There is a tag with each bundle to show the lot number, bundle number, and blank spaces for the payroll numbers of the operators who make up particular parts. Each bundle is opened and the parts distributed to those operators who have particular things to do on them. After an operator finishes her part of the work on each of the twenty-four overalls, the parts on which she has worked are tied into a bundle with the operator's number written on the card, and turned in to the desk girl, who makes a record before giving out the bundle to the next operator.

DETAILED JOB ANALYSIS

In actual factory production the overalls are made by units or bundles of twenty-four pairs. The operator does some operations singly. That is it is repeated twenty-four times before the next operation is begun. Sometimes the operations go in pairs, that is, it is best to do two of them on one piece of goods while it is under the machine than to do only one before proceeding to a similar piece of the next pair of overalls. Similarly it is possible to have operations grouped in threes, fours and perhaps fives. There is always a great need for study to group these operations in the best way. Where pieces are cut in pairs, as in sleeves, with rights and lefts it is usual to go through an operation alternately on a right and then on a left or vice versa, until the twenty-four pairs of rights and lefts have been put through.

In the detailed analysis which follows it is not always possible to indicate exactly a factory process. The orders will appear as if only **one** pair of overalls is being made, but the reader should be able to visualize the process with a "factory eye."

PAYROLL JOB—POCKET GIRL

The pocket girl operates a two-needle machine, which sews two rows of stitches about $\frac{1}{4}$ " apart. She makes and sews two hip-pockets and a rule-pocket onto the backs of the overall.

1. Hem top edge of hip-pockets: Put pocket outside on machine right side up. Fold $\frac{3}{8}$ " under and stitch once across.
2. Hem slanting face of rule pocket: As in 1.
3. Sew on left hip-pocket: Put left back in machine right side up. Place pocket with top edge at punch-marks. Folding under edge in front of the needle, tack right top corner, stitch around pocket to left top and tack.
4. Sew on right hip-pocket: As in 3, on right back.
5. Sew on rule-pocket: Place pocket just below right hip-pocket even with outside edge of back. Folding in edges, tack and sew down and around from side-seam corner to left top corner then across top to slanting face and tack.

Auxiliary Information

Trade Terms:

Material—hip and rule-pocket pieces, backs, white cotton thread.

Tools—two-needle flat-bed machine, scissors.

Operations—hemming, folding under, turning in, separating, pairing, stitching, tacking.

Location—top edge, right side of cloth up, slanting face, left and right side of garment, punch-marks, right and left top corners, below, outside edge, side seam.

Stock:

Recognition—plain blue, white or khaki denim, striped denim, weight by description on tags, all parts by shape, rights and lefts, No. 30 upper thread, No. 36 lower or loop thread.

Working properties—cloth is heavy and somewhat stiff for folding, dulling and breaking needles frequently.

Safety: Folding under and hemming is done with fingers, which are protected by a needle guard.

Care of Tools: Nothing special.

Drawing: None.

Mathematics: Folding under $\frac{3}{8}$ " by eye, spacing pockets side-wise accurate to $\frac{1}{4}$ " either way.

PAYROLL JOB—FIRST PART GIRL

The first-part girl makes and joins together various parts of both fronts and backs of the overall, operating a one-needle machine. Most of the work is on the fronts, as the fly, swing pockets and facing of side openings. On larger sized overalls the cloth is not wide enough to cut the backs out complete, so small triangular pieces have to be added to the crotch or seat. The cutters make small notches on edge of cloth at all necessary points to locate positions for joining or folding.

1. Sew on seat-pieces: Put left back inside the machine wrong side up, placing corresponding seat-piece beneath it right side up, and seam edge extending out about $\frac{3}{8}$ ". Stitch once down and pull out the seat-piece from beneath into place. Move back piece around to outside position on the machine, fold edge of seat-piece seam flat and sew down along the edge. Repeat with right back piece. Trim off ends of seams.
2. Hem side facings on backs: Put right back inside machine wrong side up. Fold over hem for side opening $\frac{1}{4}$ " wide at lower side notch and as far as notch on top of back. Stitch down from top and out at bottom edge of hem (edging out). Repeat with left back, sewing upwards from bottom of facing.
3. Sewing swing-pocket facings to drill: Put drill flat on machine, inside of pocket face up. Lay denim facing on drill

right side up with angular corners and edges corresponding. Stitch around inner edge of facing. Make rights and lefts in pairs.

4. Make button side of fly: Place right front inside on machine wrong side up. Fold over from side cut to notch on top. Turn in edge of this facing and stitch from top down and edge out at bottom.
5. Make button hole side of fly: Put left front inside on machine wrong side up. Fold over from side cut to notch on top. Lay fly (see button-hole girl) over this fold with its folded edge $1/16$ " inside the lower fold. Stitch from edge at bottom end of fly up just back of the buttonholes straight out at top edge. Trim off extra goods at top end.
6. Put swing pockets in fronts: Place left front outside on machine right side up. Lay drill for pocket flat underneath with inside of pocket face down, locating by notches on top and side. Fold under from notch to notch to form oblique facing for pocket, and stitch down $1/4$ " (a "foot") away from edge. Roll the entire front over onto inside of machine wrong side up. Fold drill over to form the pocket, matching notches at lower side seam (pocket now inside out). Stitch bottom of pocket from notches over to folded edge and tack at end of run. Roll the front over pocket back into outside position again. Pull drill pocket through itself to bring right side in, and at the same time bring triangular denim facing into position just beneath and squaring out the shape of front at oblique edge of front pocket-facing. Stitch across top edge of front and triangular facing. Lay button-stay wrong side up on the front at side opening and sew from top to bottom at edge. Fold stay-piece underneath front, stitching up to top near the edge and return a "foot" away for a double seam, tacking at bottom angle of swing pocket in process of last downward seam. Repeat with right front swing pocket.

Auxiliary Information

Trade Terms:

Material—seat-pieces, backs, swing pocket drill, triangular pocket facings, buttonhole fly, button-stay, white cotton thread.

Tools—one-needle machine, scissors.

Operations—folding under, folding over, hemming, edging out, stitching, matching notches, pulling inside out, tacking.

Location—wrong and right side up, outside and inside on machine, on top and beneath, right and left, side openings, a "foot" away, bottom angle of swing pocket, notches at certain points.

Stock:

Recognition—denim, drill, parts by shape. No. 30 upper, No. 36 lower thread.

Working properties—nothing additional.

Safety: Nothing special.

Care of tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring $\frac{3}{8}$ ", $\frac{1}{4}$ " and $\frac{1}{16}$ " by eye.

PAYROLL JOB—SEAMER

The seamer operates a two-needle flat bed machine with folding attachment, to join together certain parts of the overall before it goes to the second stage of one-needle work.

1. Join right and left backs: Place backs in folder right side up, stitching from top to crotch.
2. Join outside of legs: Put bottom ends of left front and back outside and inside respectively on machine, right side up. Insert in folder and sew from bottom to notch at side facing. (Side seams must always face back, that is, fronts always over backs). Similarly put top ends at right front and back in folder, sewing from notch at bottom of side facing to bottom of leg.
3. Seam bib: Put right and left halves right side up in folder, stitching from top to bottom.

Auxiliary Information

Trade Terms:

Materials—backs, fronts, bib-pieces, white and colored thread.

Tools—two-needle machine, folder, scissors.

Operation—seaming.

Location—right side up, fronts over backs, rights and lefts, crotch, bottom, side facing notches, setting folder fair, and forward or back to suit goods. White thread always in needle, any color for lower or loop thread.

Stock:

Recognition—parts by shapes, No. 30 upper and No. 36 lower thread.

Working properties—nothing additional.

Safety: Nothing special.

Care of tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—SECOND PART GIRL

The second part girl continues with a single-needle machine the joining work which was interrupted by the seaming process.

1. Hem bib: But bib inside on machine wrong side up. Fold over and turn in a $\frac{3}{8}$ " hem, stitching up right side of bib, across top and down left side.

2. Hem top and watch sides of bib-pocket: Lay pocket outside on machine wrong side up. Fold top and watch side over and stitch along edge returning a "foot" away.
3. Sew pocket on bib: Put bib in machine right side up, and place pocket in position on left half. Turn in edge opposite watch side, tacking at top then sewing down and around bottom to bottom of watch opening, and finishing with a tack. Return a "foot" away for double seam to lower back corner. Stitch obliquely up the back edge to a 1" opening between steams, forming a pencil pocket. Tack top of pencil-pocket seam and also at top of watch opening.
4. Tack top of side steams: Put garment in machine right side up, making a cross tacking at bottom of each side opening.
5. Join fronts at bottom of fly: Lay parts right side up with right inside and left outside on machine. Lay buttonhole side over button side in position and turn in edge below fly to crotch. Sew up edge of turned in part $\frac{3}{4}$ " onto fly. Make a 1" cross tacking. Break thread and return to crotch on wrong side, width of foot from edge.
6. Join bib to front: Put garment in machine right side up, laying buttonhole side of fly over button side in position. Stitch across top of fly. Lay bib on top of garment wrong side up with joining edges even. Put bib facing under garment wrong side up, that is, with the three layers lying edges even and like sides of cloth together. Join three layers together across top edge from right to left. Turn bib over into position and sew back a "foot" away from left to right side. Turn garment over with wrong side up. Fold over bib-facing into position and trim ends. Turn in edges of bib-facing at ends and along top, sewing with a single seam around edge.
7. Join backband to overalls: Lay two halves of backband in machine right sides together and sew once across. Open out full length and flatten seam edges. Put back of garment in machine wrong side up and lay back band over it wrong side up with top edges even. Stitch once across. Fold backband over into position. Turn garment right side up in machine and fold backband over to cover last seam. Turn in ends and lower edge and sew all around four edges of backband. When within about 6" of right end of backband insert label under foot and sew once around it before completing seam.

Auxiliary Information

Trade Terms:

Materials—bib, bib-pocket, bib-facing, partly assembled overall or garment, backband, label, white thread.

Tools—one-needle machine, scissors.

Operations—hemming, folding over, turning in, tacking, sewing, trimming, joining.

Location—right and wrong side up, like sides together, outside and inside on machine, a “foot” away, watch side, buttonhole side, button side, top and bottom of fly, over and underneath, crotch, backband, right and left.

Stock:

Recognition—all parts by shapes, No. 30 upper and No. 36 bobbin thread.

Working properties—nothing additional.

Safety and Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring $\frac{3}{8}$ ", $\frac{3}{4}$ " and 1" by eye.

PAYROLL JOB—FELLER

The felling girl operates a special two-needle machine made with its sewing head extending forward towards the operator, and clear of the table edge about twelve inches, thus making clearance for pushing closed-in parts like legs or sleeves back past the needle where they may gather around the arm-like bed. There is a folder attachment which turns in the goods one side over the other. The job is confined to closing in legs, sleeves and bodies of garments.

1. Put inside edges of bottom of right leg in folder right side out (always fronts over backs), and stitch through to crotch and continue down left leg to bottom.

Auxiliary Information

Trade Terms:

Materials—garment, white and black or khaki thread.

Tools—felling machine, folder, scissors.

Operations—felling.

Location—right and left, bottom, crotch, right side out. White thread in needle, any color for lower or loop thread.

Stock:

Recognition—garment, No. 30 upper, No. 36 lower thread.

Working properties—nothing additional.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—HEMMER

The hemming girl operates a one-needle special machine which has a head pointing forward in advance of the table allowing the overall leg to be pushed easily into place under the needle. A special folder attachment turns in the bottom once then once again.

1. Hem bottoms of overall: Place bottom of leg of garment around bed. Put upper side into the folder and sew once around. Repeat with other leg.

Auxiliary Information

Trade Terms:

Materials—overall, white thread.

Tools—one-needle special machine, scissors.

Operations—hemming.

Location—bottom of overall leg.

Stock:

No. 30 upper and No. 36 bobbin thread.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—EXAMINER

The examiner inspects all previous workmanship on the overalls.

1. Measure inseam to check length of leg with label.
2. Examine for straight seams, tackings, run-offs, raw edges, skip-stitches on side facings, outside and inside seams and bottom finish. Check even length of back and front of side openings.
3. Examine outside as in 2 on joining seams, fly, swing pockets, bib and bib-pocket.
4. Examine inside as in 2 on fly, joining seam, seat pieces, bib-facing, back seams and backband.
5. Examine outside as in 2 on hip and rule-pockets, seat-pieces, back seam, backband and label.
6. Measure waist size to check with label.
7. Snip all ravels and odd thread ends while in process of examining 2-5 above.
8. Chalk mark all repair work to be repaired and send to operators to repair.
9. Examine for tears or cuts, thin spots or other defects in goods. Stamp label on defective garments as "seconds."
10. Re-examine all returned repair work.

Auxiliary Information.

Trade Terms:

Materials—overalls, all parts by name.

Tools—yard-scale on edge of examining table, scissors, tailor's chalk, rubber stamp and pad.

Operations—Examining, inspecting, checking, chalking, stamping, placing in repair box.

Location—All parts by name.

Special—Run-offs, skip stitches, raw edges, thin spots, straight seams, lie even.

Stock:

Recognition—Parts differing in color by varying shades of blue or khaki, weight of goods by its thickness.

Working properties—None.

Safety and Care of Tools: None.

Drawing and Science: None.

Mathematics: Measuring on yard stick in inches.

PAYROLL JOB—BUTTONHOLER

The buttonhole girl has three separate jobs to perform on the overalls. She prepares the button-side of fly for the first part girl. She also puts buttonholes in the tabs of the suspender straps after they are made but before they go to the bucklers. Lastly she puts all needed buttonholes in the overall itself. The buttonhole machine is a special, which sews all around where the hole is to be then cuts the cloth. Some machines have a cording attachment which reinforces the edge of the hole with a heavy black cord bound inside of the stitching. Holes are reinforced at side openings, on strap-tabs, and for watch chain in bib, but the fly buttonholes are not reinforced (done on a smaller machine). All machines make what is called a pearl stitch, using number 30 thread.

1. Make buttonholes in fly: Fold goods over lengthwise right side out, with upper edge lying $\frac{1}{4}$ " inside the lower. Turn fly over and mark the first of the lot with a gauge according to its size for number and position of holes. (Others of that size need not be marked.) Place in machine folded edge first, marked side up and make the three or four holes in series.
2. Make strap-tab buttonholes: Place tab end of suspender endwise into machine and make hole in center of the goods.
3. Make buttonholes on overall: Set garment in machine right side up at desired position, making holes in the following order—two at right side opening, one in bib for watch chain, two at left side opening.

Auxiliary Information

Trade Terms:

Materials—overalls, straps, buttonhole flies, reinforcing cord,

No. 30 thread in needle and bobbin.

Tools—special buttonhole machines, seissors, marking gauges.

Operations—folding over, marking, stitching holes.

Location—side openings, bib top, strap tabs.

Stock:

Recognition—lot numbers by sizes.

Working properties—nothing additional.

Safety and Care of Tools: Nothing special.

Drawing: Marking at notches in gauge.

Science: None.

Mathematics: Spacing holes by eye, correct to $\frac{1}{4}$ " on fly and side openings, and to $\frac{1}{8}$ " on ends of backband.

PAYROLL JOB—MARKER

The marker locates positions for buttons in advance of the patent button tacker.

1. Mark fly: Lay overall on table front side down, and turn backband down to expose inside of fly. Turn edge of button side back over far enough to show part of buttonholes. Chalk button side opposite each hole.
2. Mark side openings: Replace backband and straighten garment out flat. Mark for button at middle of side openings. Band buttons need none.

Auxiliary Information

Trade Terms:

Materials—overalls.

Tools—tailor's chalk.

Operations—laying out flat, folding back, marking.

Location—button and buttonhole sides of fly, side openings, backband.

Stock: Nothing additional.

Safety and Care of Tools: None.

Drawing: Marking positions with chalk.

Science and Mathematics: None.

PAYROLL JOB—BUTTON TACKER

The button girl operates a patent tack button machine which pushes the metal tack part of the button up through the cloth and clinches it inside the button proper. It carries magazines and dies for two sizes, smaller ones for the fly and a larger size for sides and suspenders. The magazines, called cups or turrets, are in pairs, one feeding tacks and the other buttons down through the ways to the dies.

1. Put on fly buttons: Place front of button side up in machine on small size die. Set according to mark and press treadle, repeating at required number of marks.
2. Put on side and suspender buttons: Put overall under large size die right side up, attaching buttons in the following order: two at opposite corners of bib, two at left side opening, two on backband for suspenders, two at right side opening (all but lower side buttons put on without marks).

Auxiliary Information

Trade Terms:

Materials—overalls, buttons and tacks.

Tools—special patent button tacker.

Operations—tacking.

Location—as in 2 above.

Stock:

Recognition—buttons and tacks, each in separate cartons, sizes indicated by "lines," as 22-line or 27-line buttons.

Working properties—buttons jam in dies and miss hitting fair.
 Safety: Use a wire to fish out jammed buttons. Pull off defective buttons with pliers and notched steel plate.

Care of Tools: Change dies for different kinds of buttons.

Drawing and Science: None.

Mathematics: Spacing buttons by eye correct to $\frac{1}{4}$ " for suspenders, $\frac{1}{16}$ " for ends of bib-belt, and exactly on side marks.

PAYROLL JOB—STRAPMAKER

The strapmaker works up the suspenders completely with exception of buttonholes and wire slides and loops. She operates a one-needle machine.

1. Join web and tab: Cut elastic web into lengths. Lay tab-piece inside on machine, wrong side up and fold over $\frac{3}{8}$ " of outside edge. Lay end of web on this fold $\frac{3}{8}$ " from far corner and tack the two together. Fold over nearest edge to far edge, swing tab into outside position on machine and sew across to $\frac{3}{8}$ " from edge. Turn in edges of both upper and lower layers of tab then complete stitching. Turn in side edges to end of tab and sew till $\frac{3}{8}$ " from bottom end of tab. Turn in both layers of bottom end and complete stitching around and up folded edge to web.
2. Make straps and join to web: Place strap on machine wrong side up. Fold over lengthwise as far as side cut for strap part. Turning in edges of both upper and lower layers along side and at end, sew all around the double portion of strap. Fold over opposite end of remaining part $\frac{3}{8}$ ", lay free end of web over it and tack the two together. Repeat with another strap, forming right and left of a pair.
3. Join straps together: Lay a pair one over the other right sides together, and stitch the joining parts together in line with folded edge of strap and tab. Pull out flat and lay wrong side up. Lay facing piece right side up over the joining seam. Turn in all four edges of facing and sew all around to cover seams and complete the joining.

Auxiliary Information

Trade Terms:

Materials—elastic webs, top pieces, strap-pieces, facing-piece, No. 30 and 36 white thread.

Tools—one-needle flat-top machine, scissors.

Operations—separating, tacking, folding over, turning in, stitching.

Location—right and left, joining part, right and wrong sides up, No. 36 thread in bobbin.

Stock:

Recognition—elastic web in lengths of a dozen pieces trade

marked and spotted for separating with seissors. Cloth parts by name and shape.

Working properties—nothing special.

Safety and Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring $\frac{3}{8}$ " by eye.

PAYROLL JOB—BUCKLER

The buckle girl adds the wire loops and slides to suspender straps after they have come from the buttonholer. The loop is the part which hooks over the bib-button, and the slide is for adjusting length of strap.

1. Put on slides and loops: Draw 10" or 12" of strap end through slide over middle bar and about 6" back through slide again. Put loop over free end of strap. Put this end up inside over middle bar of slide and back inside below it with $\frac{1}{2}$ " free end. Draw outer part of strap down through slide to hold free end in place.

Auxiliary Information

Trade Terms:

Materials—straps, slides, loops.

Tools—none.

Operations—drawing through, sliding on.

Location—over and under middle bar of slide, inside and outside strap.

Stock:

Recognition—strap end of suspender, loops and slides in cartons.

Working properties—straps stiff to pull through.

Safety and Care of Tools: None.

Drawing and Science: None.

Mathematics: Measuring 10" or 12", 6" and $\frac{1}{2}$ " by eye.

PAYROLL JOB—SORTER

The sorter may have two duties, the main one of sorting coming first in preparation for the folders, and the second, tying up bundles, following after the folders are through. If work is coming through in large volume this job may be divided on that basis so that the sorter would be confined to the one operation only. It follows after the button tacker is through.

1. Sorting overalls by sizes: Bring lots from bins to sorting table. Sort by waist-size and leg-length numbers on label. Pile in stacks by sizes for folders.
2. Tie in dozens after folders: Hang a bunch tie strings about neck. Place string around dozen near one end, slipping end through the wire loop and drawing tight. Pull end into grip of the wire loop and put a half loop on to hold. Pack tied dozens in elevator truck.

Auxiliary Information**Trade Terms:**

Materials—overalls.

Tools—tying strings.

Operations—sorting, stacking, tying, packing.

Location—sorting, stacking and folding tables.

Stock:

Recognition—label numbers indicating first waist size and second length of leg in inches, as 40-31, 40-32, 38-32, 36-33, etc.

Working properties—nothing.

Safety and Care of Tools: None.

Drawing and Science and Mathematics: None.

PAYROLL JOB—FOLDER

The folder, as the name indicates, arranges the overall into neat and compact shape for packing, so folding it that the label sewn to the right end of backband is easily seen by those handling the garment afterwards.

1. Folding: Lay overalls flat on table front up. Button strap tabs to bib, and fold both under at belt line inside the garment. Fold right side to left side bringing label on top. Reverse with label below and fold bottoms to belt. Stack in dozens of uniform size, half of stack being placed end for end to balance its shape.

Auxiliary Information**Trade Terms:**

Materials—overalls, suspender straps.

Tools—none.

Operations—buttoning, folding, counting, checking sizes.

Location—inside, front down, front up, end for end.

Stock: Nothing additional.

Safety and Care of Tools: None.

Drawing and Science: None.

Mathematics: Counting in half and full dozens.

Sleeping Wear Department

The sleeping garments for adults are made exclusively in this department, which is the most extensive from standpoint of quantity and variety of product. Four main types of garment are made, nightgowns and shirts, pajama suits, pajunions, and pajunettes. Some special garments are made such as heavy woolen, hooded, outdoor sleeping gowns, but these form a negligible item. In addition to the different sizes in the four main lines, there are very many varieties and designs of finish, so that operators are provided with a great many changes. During the winter season the factory works on summer varieties of sleeping garments, and the summer is spent

in working up next winter's supply of flannel garments. In all there are some 125 varieties of sleeping garments to make, ranging from the extremely plain to the most ornate.

Ladies' nightgowns, men's nightshirts, and pajamas are familiar enough to need no defining. The pajunions and pajunettes are fancy styles of ladies' sleeping wear made somewhat after the fashion of the men's pajamas. The pajunion is a union of the pajama jacket and pants into one garment, the joining being made at the waist, and the jacket extending down around the body for 8" or 10" outside. The pajunions are simply hemmed at the bottoms. Pajunettes are the still more ornate styles, made in one piece, without the jacket effect, and having elastic inserted at the bottoms, or being completely footed. Various special machines are in use for briar-stitching, hemstitching, wave-stitching, and the use of braid and ribbons for trimming extends the scope of the department to an unlimited degree.

Winter garments are made almost exclusively of flannelette in white, pinks and blues, either plain or with woven stripes of differing shades and colors. Summer garments are made from prints, cambries, silks, satins, soisette and other trade names for products of cotton and silk.

The cut goods come from the cutting room in bundles of twenty-four. All accessory materials like braid, ribbon, loops, buttons, etc., are brought in boxes or crates from the stores department where they were assembled according to the descriptive sheet ready for

No.	Payroll Job	Work Jobs
1	Girdle maker	Pants—Make girdles.
		Jacket—0.
2	Seamer	Pants—make outseams, sew on seat-pieces, join backs.
		Jacket—0.
3	First part girl	Pants—Hem or tassel ends of girdle, make fly, hem top, join fronts.
		Jacket—Make yoke and neck-facings, sew on pocket, join shoulders, sew on yoke, hem fronts.
4	Sleeve piecer	Pants—0.
		Jacket—Join sleeve-pieces.
5	Sleeve maker	Pants—0.
		Jacket—Sew on cuffs, tack at wrist.
6	Examiner	Pants—Inspect previous workmanship.
		Jacket—Inspect previous workmanship.
7	Bundle boy	Pants—0.
		Jacket—Match sleeve and body bundles.
8	Sleever	Pants—0.
		Jacket—Join sleeves to body.
9	Feller	Pants—Fell inseams.
		Jacket—Fell sleeves and sides.
10	Marker	Pants—Mark for fly buttons.
		Jacket—Mark for buttonholes, mark for buttons.
11	Loop girl	Pants—0.
		Jacket—Sew loops or frogs on front.
12	Hemmer	Pants—Hem bottoms.
		Jacket—Hem bottom.
13	Examiner	Pants—0.
		Jacket—Inspect sleeving, felling, hemming, and loops.
14	Buttonholer	Pants—Make buttonholes in fly.
		Jacket—Make buttonholes through loops.
15	Button sewer	Pants—Sew on fly buttons.
		Jacket—Sew on front buttons.

use when called for. Many of these accessories are in lot-lengths and require to be cut into individual pieces by the operator when needed.

For purposes of getting instructional material in the operation of this department it will be sufficient to make a study of two typical standard garments—the pajama suit, and night gown. The night gown has one-piece fronts and backs with yoke construction, while the pajama suit has open coat and pants construction.

An airplane view of the making of a typical pajama suit will show the organization outlined on page 42.

DETAILED JOB ANALYSIS

The fact that there are two parts to the suit makes it possible to organize production on the parts individually or with the suit as a unit. Of two first part girls, one may work exclusively on pants and the other on jackets, or each may work on both parts. The organization scheduled above may be used either way. In the analysis which follows, the form adopted will be simply an expansion of the outline just presented. The form may appear to read as if but one suit is being made. In all cases it is necessary to interpret quantity production on the basis of units or bundles of twenty-four. In some cases one single operation will be done on each of twenty-four pieces of the garment. Sometimes the operator will do two operations on the piece while it is in the machine before taking the next similar piece. In this way she may have studied and experimented until she has found for herself that pieces may have one, two, three or four operations performed while going through once, according to conditions, parts, and her own skill. This study results in higher speed, and consequently higher wages on the piece-rate basis. Sleeves and other duplicate parts usually go through in pairs, that is, one operation done on a right will be done perhaps in a reverse order on the left before the next right is put under the machine.

It should be noted particularly that auxiliary information which is common to all payroll jobs and work jobs has not been repeated each time a job is analyzed. The words “nothing additional,” “nothing special,” or “none” do not mean that if a girl is being taught some particular payroll job where such words are used descriptively, she has nothing on these points to be taught. It does mean that for sake of saving endless repetition of this data, it has been stated elsewhere in this study as common or general auxiliary knowledge, which must be taught to this girl now, and that on these items there is no special information peculiar to this job which requires teaching in addition to the general facts. This general information includes instruction on properties of materials used, on operating principles of machines, on their care, and on factory procedure and organization.

PAYROLL JOB—GIRDLE MAKER

The girdle maker operates a special two-needle machine and folder. It is used also for making what is called continuous facing, but the work is identical except for length of the pieces put through. The needles are spaced about five-eighth inches apart, and the folder doubles the cloth strip over, turns in both raw edges forming a strap about $\frac{3}{4}$ " wide which is then sewed along the edges. The girdles are sewn in half-lengths and are joined by the first part girl later.

A. Pants:

1. Make girdles: Feed strips of cloth into the folder. Count out bundles of 48 half-lengths.

Auxiliary Information

Trade Terms:

Materials—girdle stock, thread.

Tools—special two-needle flat-bed machine, scissors.

Operations—feeding the folder, counting out bundles.

Location—setting folder fair, keeping edges of stock running out against the edge of folder.

Stock:

Recognition—girdle pieces by shape, No. 80 white thread.

Working properties—Nothing special.

Safety and Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Counting in forty-eights.

B. Jacket: Nothing.

PAYROLL JOB—SEAMER

The seamer operates a two-needle flat-bed machine with folder. The operations have to do with preparing the pants for the first part girl. With extra large sizes of pajama pants it becomes necessary to cut and make with an outseam, but otherwise there is none. This job is done first if needed, and the leg piece treated thereafter as if there were no seam in it.

A. Pants:

1. Make outseams if required: Lay front part of right leg inside and back part outside on machine right side up. Place in folder and sew from top to bottom of seam. Lay parts of left leg in same relation, but sew from bottom to top.
2. Sew on seat-pieces: Put right leg outside on machine, right side up, and insert in lower part of folder. Place corresponding seat-piece in upper part of folder, sewing from bottom upwards. Put left leg inside on machine right side up, and insert in upper part of folder. Place corresponding seat-piece in lower part of folder and sew from bottom upwards.
3. Seam right and left legs together at back: Put right and left legs in lower and upper parts of folder as they lie at finish of operation 2 above. Stitch from crotch to top of goods.

B. Jacket: Nothing.

Auxiliary Information

Trade Terms:

Materials—leg-pieces, seat-pieces, thread.

Tools—two-needle flat top machine, scissors.

Operations—seaming, joining.

Location—top and bottom of outseams, seat-piece seams, joining seam, crotch.

Stock:

Recognition—parts by name and shape, No. 80 white thread.

Working properties—nothing additional.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—FIRST PART GIRL

The first part girl does a number of single needle operations. On the pants she practically finishes the garment, since it only remains to have the bottoms hemmed and the buttons sewn on the fly after it leaves this machine. On the jacket she does all the single needle work. In a sense therefore the name of the payroll job is a misnomer, since there is no second part or stage of single needle work to be done as there is in making the gown. The name sticks however, because it is single needle construction which constitutes the main part of making all garments.

A. Pants:

1. Hem, or hem and tassel, ends of girdle: If simply hemmed, fold over $\frac{1}{2}$ " and once again, sewing across and tacking. If a tassel is added, lay base of tassel on hem before sewing a box tack.
2. Make fly: Put left front of garment outside on machine right side up. Lay buttonhole fly (see buttonholer) over with its raw edge even with raw edge of front, and top end $\frac{1}{2}$ " above the lower of two notches on front edge, near the top corner. Sew $\frac{3}{8}$ " from raw edges, starting at bottom and ending at top of buttonhole piece. Lay left front inside on machine wrong side up. Fold fly over so as to bring its folded edge just even with folded edge of goods to which it is sewn. Turn in back edge of fly and sew from bottom end clear through to top of garment. Put button side outside on machine wrong side up. Lay button-stay underneath wrong side up with edges even and top end at upper of two notches on front edge of button-side. Sew along edges from bottom of stay to lower of two notches on front edge of button side, then sew from this notch across button-stay until $\frac{1}{2}$ " from its inner edge. Tack end of this run. Cut with scissors through two layers of goods across the button-stay just above the last seam and as far as the tacking. Trim out the por-

tion of button-stay only above the cut just made. Turn button stay inside out until seam comes to edge, pushing angle of seam out square with tip of finger. Lay button side at inside position wrong side up, and sew up along outer edge of button-stay as far as top corner, then in across the end as far as it was cut away. Fold over part of right front which lies at top end of the stay as far as it was cut with scissors, and continue the seam up this folded edge to top of garment. Return a seam down a "foot" away from this edge to top of button stay. Turn in back edge of button-stay and continue this seam down to bottom of stay.

3. Put in girdle: Lay garment in machine wrong side up and stitch down at joining seam (middle of back) about 1". Overlap ends of two half-lengths of girdle under the needle at this point and tack them to garment. Fold top edge of garment over the girdle, forming a wide hem lying exactly between the two notches on front edge of buttonhole side. Turn in lower edge and tack corner of hem. Sew clear through lower edge of top hem until 1" from end of right or button side. Stich label under lower edge of hem at this point and continue seam to edge of garment with a tack. (Care is needed to see that girdle is not sewn in with the hem at any point.)
4. Join fronts below fly: Check position from top hem of garment, laying outsides of fronts together and fly edges even. Sew from lower end of fly to crotch $\frac{3}{8}$ " from raw edges. Pull garment out flat on machine, right side up, and sew over this last seam from crotch back to fly. Tack bottom of fly crosswise. Sew back from fly to crotch a "foot" away to catch raw edges of hem beneath.

Auxiliary Information

Trade Terms:

Materials—garment (leg-pieces joined at back), fly, button-stay, half-length girdles, tassels, label, thread.

Tools—one-needle flat bed machine, scissors.

Operations—hemming, folding over, turning in, turning inside out, tacking, trimming, checking, joining.

Location—left and right fronts, outside and inside on machine, right and wrong side up, top and bottom of fly, folded and raw edges of fly, lower of two front notches, outer and inner angles at top of button stay, top edge at joining seam, bottom of fly, crotch, a "foot" away.

Stock:

Recognition—all parts by name and shape, No. 80 white thread.

Working properties—nothing additional.

Safety: Needle guard on the foot prevents fingers from getting under the point.

Care of Tools—Nothing special.

Drawing and Science: Nothing special.

Mathematics: Measuring $\frac{1}{2}$ ", 1", $\frac{3}{8}$ " by eye correct to $\frac{1}{8}$ ".

B. Jacket:

1. Sew labels and size tab on yoke: Cut apart with scissors and fold or crease under ends of labels. Place yoke in machine right side up, and put label in position 1" from middle of top edge. Sew all around label, inserting size tab under one end.
2. Sew front or neck facings on yoke: Place yoke outside on machine right side up. Lay left shoulder facing on yoke wrong side up with notched end at shoulder edge of yoke, edges even, and stitch towards neck $\frac{3}{8}$ " from raw edges. Repeat with right shoulder facing, sewing from neck to shoulder. Cut threads.
3. Make and sew on pocket: Lay pocket in machine wrong side up. Fold over top edge as far as side notches, turn in edge for hem and sew once across. Put left front in machine right side up. Lay pocket in position with top edge opposite bottom of armhole and front edge in line with meeting point of neck and shoulder edges. Vary position nearest distance sidewise to match stripes. Box top corner at armhole, turn in edge, and sew around bottom to front top with a box finish to seam.
4. Join fronts to back: Lay back outside on machine wrong side up. Place right front on top, right side up, with its shoulder edge $\frac{1}{4}$ " inside shoulder edge of back. Stitch across a "foot" away from shoulder edge of front, sewing toward neck. Repeat with left front, sewing from neck to armhole. Pull garment out flat with fronts at inside position right side up. Fold raw edge in, and sew from armhole to neck. Repeat with right shoulder, sewing from neck to shoulder.
5. Join yoke and neck facings to garment: Lay garment outside on machine right side up. Fold over upper end of left front hem as far as notch. Refold over $\frac{3}{8}$ " of this hem and press flat. Lay left neck-facing and yoke over these hem folds, wrong side up with shoulder seams of yoke and body part matching and neck edge $\frac{1}{8}$ " below neck edge of body. Sew from left front edge around neck until 4" from right front edge. Fold over top of right front edge as far as notch and refold over $\frac{3}{8}$ ". Lay these front hem folds under the right end of the neck-facing then continue the seam to right front edge. Trim off front end of facings. Snip raw edge of the neck at intervals with scissors so that in next operation it will lie flat. Turn yoke and facings over to inside position on body (or turn neck seam inside out), pushing the angles or points of

front hems out sharp and definite on the closed end of scissors.

6. Finish front hems and neck facings: Lay garment on machine wrong side up and flatten out the neck seam all around. Tack at right front angle or point then sew a "foot" away from neck edge clear around to left front point. Continue this seam down left front hem a "foot" away from folded edge to bottom of jacket. Turn in back edge of left front hem and sew up from bottom to edge of neck-facing. Turn in lower edge of neck facings and yoke, sewing around to right front and down to bottom of jacket on back edge of right front hem. (The right front has no seam a "foot" away from edge, as it is the button side and is covered over when buttoned up.)

Auxiliary Information

Trade Terms:

Materials—labels, size-tabs, yokes, neck facings, fronts, pocket pieces, backs, thread.

Tools—one-needle flat top machine, scissors.

Operations—cut apart, crease, join, box, turn in, fold over, re-fold over, trim, snip, turn inside out.

Location—top edge of yoke, notched end of neck facings, outside and inside on machine, wrong and right side up, edges even or offset $\frac{1}{8}$ " or $\frac{1}{4}$ ", opposite left armhole, below meeting point of neck and left shoulder edges, facings over top ends of front hem folds, facings inside on body, angles or points at top of front hems, a "foot" away from edge, bottom of front hems, back edge of front hems, front hem notches.

Stock:

Recognition—all parts by name and shape, No. 80 white thread
Working properties—nothing special.

Safety: Nothing special beyond needle guard.

Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring $\frac{1}{8}$ " exact, $\frac{1}{4}$ " accurate to $\frac{1}{16}$ ", $\frac{3}{8}$ " accurate to $\frac{1}{8}$ " and 1" accurate to $\frac{1}{4}$ " by eye.

PAYROLL JOB—SLEEVE PIECER

The sleeve piecer operates a two-needle flat bed machine with folding attachment. Her duty is to join the sleeve parts with a seam running lengthwise of the arm. Sleeves come in two parts because they can be cut to advantage from the goods in that way, and the cost of piecing them is not so great as the loss of goods would be if cutting them in wholes. These seams must always be run so as to face the back.

A. Pants: Nothing.

B. Jacket:

1. Put pieces of right sleeve in the machine right side up with front piece at inside position. Sew from shoulder to wrist. Repeat with left sleeve sewing from wrist to shoulder.

Auxiliary Information

Trade Terms:

Materials—sleeve pieces, thread.

Tools—two-needle machine with attachment, scissors.

Operations—joining.

Location—right side up, front piece inside on machine, right and left, wrist and shoulder ends.

Stock:

Recognition—sleeve parts by size and shape. No. 80 white thread.

Working properties—nothing special.

Safety and Care of Tools: Nothing additional.

Drawing, Science and Mathematics: None.

PAYROLL JOB—SLEEVE MAKER

The sleeve maker uses a one-needle machine without folder. Her work is to put on the cuff and tack the ends of the cuff together ready for the feller. The latter operation, however, does not come until after the sleeve has been put in the garment. That is, the sleeve is sewn in after the cuff is on, but while the shoulder end is still in the flat. Cuffs may be just plain bands or they may have angular points or curved lines for their upper edges. In the irregular designs the widest part of the cuff is placed on the upper side or back of the arm.

A. Pants: Nothing.

B. Jacket:

1. Put cuff on sleeve: Put left sleeve outside on machine wrong side up. Lay cuff on top wrong side up, straight edges even, and widest part towards back of sleeve. Sew across a "foot" away from edge. Repeat with right sleeve. Fold cuff over into outside position with seam exactly at edge, and crease goods flat. Put sleeve outside on machine right side up and sew across a "foot" away from edge of cuff. Swinging sleeve to inside position right side up, turn in and sew along upper edge of cuff. Trim off ends of cuff even with sleeve. Repeat with right sleeve.
2. Tack ends of cuff: Put sleeve outside on machine wrong side up, and cuff end furthest off. Fold outer end of cuff over and in until $\frac{1}{4}$ " from inner end. Tack $\frac{1}{2}$ " along this upper raw edge and edge out. Fold the $\frac{1}{4}$ " lower extension over to meet the upper tacked edge, and fold over once more making a hem about $\frac{3}{16}$ " wide. Sew a box tack 1" long in this hem. This holds cuff, and makes a starting place for

the felling machine. This operation is identical for both right and left sleeves, no account being taken of the direction which the felled seam faces, both being started at the cuff. Arrange sleeves in pairs.

Auxiliary Information

Trade Terms:

Materials—sleeves, cuffs, thread.

Tools—one-needle machine, scissors.

Operations—cuffing, hemming, tacking, edging out.

Location—outside and inside on machine, right and wrong side up, right and left sleeves, back or outer side of sleeve, shoulder and wrist ends.

Stock:

Recognition—sleeves right and left by seam, cuffs right and left by shape, No. 80 thread.

Working properties—nothing additional.

Safety: Needle guard on foot of machine.

Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring $\frac{1}{4}$ ", $\frac{3}{16}$ ", $\frac{1}{2}$ ", 1" by eye, a "foot" away.

PAYROLL JOB--EXAMINER

At this stage the examiner receives the jacket bodies from the first part girl and the sleeves from the sleeve maker in separate bundles. They are each inspected before going to the sewer.

A. Pants:

1. Examine pants: Check length of sides and evenness of fly. Inspect all seams for runoffs, skips and raw edges. Look for defects in goods.

B. Jacket:

1. Examine sleeves: Inspect piecing seam, looking for straight seams, runoff, skip stitches and raw edges. Inspect cuffs for similar things, and also for width of tacked hem to see that it is not too wide for the folder of the felling machine.
2. Examine jacket body: Check for even distance on each side of neck from shoulder seam to front points. Check length of front hems and see that they are of uniform width. Check position of pocket. Look in all three cases for runoffs, skip stitches, raw edges, and for defective goods.
3. Report to forelady all imperfect garments for repair.

Auxiliary Information

Trade Terms:

Materials—pants, jacket bodies, sleeves.

Tools—none.

Operations—checking lengths, inspecting seams.

Location—all parts of garment by name.

Special—runoffs, skip stitches, raw edges.

Stock:

Recognition—all parts of garment by name.

Working properties—nothing special.

Safety and Care of Tools: None.

Drawing and Science: None.

Mathematics: Measuring uniform widths by eye, measuring 3/16" boxed hem by eye.

PAYROLL JOB—BUNDLE BOY

The sorter or bundle boy takes bundles of jacket bodies and sleeves in the racks and carefully checks body and sleeve bundles by numbers on tags so that the sleever will get mated bundles tied together. Each heretofore were coming through the processes entirely independent of each other, and must now be checked for assembling.

A. Pants: Nothing.

B. Jacket:

1. Sort and tie bundles together: Find two bundles in bins having tags with identical lot and bundle numbers. Tie same together. Place in bin.

Auxiliary Information

Trade Terms:

Materials—bundles.

Tools—tie strings.

Operations—sorting, tying.

Location—position of bins containing certain lot numbers.

Stock:

Recognition—tags by lot and bundle numbers.

Safety and Care of Tools: None.

Drawing, Science and Mathematics: None.

PAYROLL JOB—SLEEVEVER

The sleever operates a two-needle flat bed machine with folder. She joins sleeves to bodies.

A. Pants: Nothing.

B. Jacket:

1. Join sleeves to body: Snip raw edges of armhole at various points to help it spread in seam. Lay body inside on machine right side up, and sleeve in right position on outside. Sew left sleeve from front to back of armhole and right sleeve from back to front (seam facing sleeveward).

Auxiliary Information

Trade Terms:

Materials—bodies, sleeves, thread.

Tools—one-needle machine, scissors.

Operations—joining, snipping.

Location—edge of armhole, outside and inside on machine, right side up, front and back of armhole, seam faces sleeve, right and left sleeve.

Stock:

Recognition—body, right and left sleeve, No. 80 thread.

Working properties—nothing special.

Safety and Care of Tools: Nothing special.

Drawing and Mathematics: None.

Science: Reversing edge of shoulder goods back into the seam requires that it take a larger circumference of a circle, that is, the edge must expand. If not snipped it will not expand but will draw and pucker. The snipping allows goods to open up at the cuts and thus lie flat.

PAYROLL JOB—FELLER

The felling girl runs a two-needle special machine with a folder. The head extends forward from edge of table about 10" or 12", and the bed is small and round like an arm so that sleeves may be pushed back over it when joined into tubular shape. The work consists of closing sleeves and bodies.

A. Pants: Nothing.

B. Jacket:

1. Fell sleeve and body seams: Insert tacked end of cuff behind the folder under the needle. Bring edges in through the scrolls to position. Sew from cuff to armhole then down side of body to bottom. Repeat with other sleeve.

Auxiliary Information

Trade Terms:

Materials—jacket, thread.

Tools—two-needle special with folder, scissors.

Operations—felling.

Location—cuff behind folder, sleeve edges in folder, armhole, bottom of jacket.

Stock: Nothing special.

Safety and Care of Tools: Nothing additional.

Drawing, Science and Mathematics: None.

PAYROLL JOB—MARKER

The marking girl has two stages or operations on the jacket, and one on the pants. In the former she must mark position of loops, then after the buttonholes are sewn through the loops she marks for the buttons.

A. Pants:

1. Mark for fly-buttons: Lay garment flat on table front up. Turn back edge of outer or buttonhole fly until holes are partly exposed. Mark opposite them on button side.

B. Jacket :

1. Mark for loops or frogs: Lay garment flat on table front up. Select pattern by size number on label sticker and place over left front hem. Mark at notches in pattern with pencil or chalk.
2. Mark for buttons (at a later time on this garment): Lay garment flat on table facing up. Put loop side over button side in exact position and mark through buttonholes with pencil or chalk.

Auxiliary Information

Trade Terms:

Materials—pants, jackets.

Tools—black pencil or colored to show on various colors of prints, pattern.

Operations—marking.

Location—buttonhole and button side of fly, loop and button side of jacket, fronts up.

Stock: Nothing additional.

Safety and Care of Tools: Do not waste pencil or chalk.

Drawing: Marking positions.

Science and Mathematics: None.

PAYROLL JOB—LOOP GIRL

The loop girl sews the loops or frogs on the buttonhole side of the jacket at marks indicated. The loops are made of fancy braid and are already tacked into shape, so that they can be sewed with a row of stitching all around, following middle of the braid except around the buttonhole part, where the stitching is along the inner edge to insure neat buttonhole.

A. Pants: Nothing.

B. Jacket:

1. Lay left front hem on machine right side up. Place loop over mark and follow all around the braid with a row of stitching. Repeat as many times as marked.

Auxiliary Information

Trade Terms:

Materials—jacket, loops or frogs, thread.

Tools—one-needle machine, scissors.

Operations—stitching.

Location—front hem, right side up.

Stock:

Recognition—thread in color to be inconspicuous on loops.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—HEMMER

The hemming girl operates a single needle flat bed machine without folder, and hems the bottom of both pants and jackets.

A. Pants:

1. Hem bottoms: Place leg of garment inside on machine drawing back the upper part so as to expose lower part against the bed wrong side up. Fold over $\frac{3}{8}$ " then over again for a $\frac{3}{4}$ " hem. Stitch once around along the turned in edge. Repeat with other leg.

B. Jacket:

1. Hem bottom: Place garment inside on machine wrong side up. Fold over $\frac{3}{4}$ " hem, turning in the raw edge and stitching.

Auxiliary Information

Trade Terms:

Materials—pants, jacket, thread.

Tools—one-needle machine, scissors.

Operations—hemming, folding over, turning in.

Location—bottom of garments.

Stock:

Recognition—No. 80 white thread.

Working properties—nothing special.

Safety and Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring $\frac{3}{8}$ " and $\frac{3}{4}$ " by eye.

PAYROLL JOB—EXAMINER

The jacket is returned to the examiner after it has been sleeved, felled, looped and hemmed, so that these operations may be inspected.

A. Pants: Nothing.

B. Jacket:

1. Examine jacket: Inspect seams at shoulder, felling seams, loops and bottom hems for straightness, rimeoffs, skips and raw edges.

Auxiliary Information

(See under first stage of examining this garment.)

PAYROLL JOB—BUTTONHOLER

The buttonhole machine is a special automatic machine which sews a pearl stitch all around the position where the buttonhole is to be, then cuts through the cloth inside the stitches. Its head stands forward somewhat from the table so that garments can be readily put in the foot in any required position. This foot moves forward and back, carrying the goods with it, and its motion may be adjusted to any length of buttonhole required. The work consists of two jobs which are timed widely apart in the making of the pajama

suit, the buttonhole fly being required at the beginning of making the pants, and the jacket coming almost at the end.

A. Pants:

1. Make buttonhole fly: Fold piece along the middle lengthwise, wrong sides in, and put into the machine. Number of holes is indicated by a table of sizes. The spacing of these is a matter of judgment and is generally arbitrarily set by noting where the end of the fly or the last buttonhole made lies with respect to some part of the bed of the machine. There is no divided scale of any kind on the machine for spacing buttonholes.

B. Jacket:

1. Sew buttonholes in jacket: Put one of the loops, which have already been sewn over the front hem at marks indicated by the marker, under the machine right side up. Repeat in any desired order with remaining loops.

Auxiliary Information

Trade Terms:

Materials—fly-pieces, jacket, thread.

Tools—special machine, scissors.

Operations—folding, buttonholing.

Location—middle of fly, front hem.

Stock:

Recognition—fly-pieces by shape, No. of thread.

Working properties—nothing special.

Safety and Care of Tools: Nothing special.

Drawing, Science or Mathematics: Spacing buttonholes by eye, accurately to $\frac{1}{4}$ " lengthwise of goods and $\frac{1}{16}$ " crosswise.

PAYROLL JOB—BUTTON SEWER

The button sewing machine is a special machine with its head standing forward from edge of table. The buttons are placed in the upper part of the foot, and the garment in the lower part of this same foot. The whole foot is controlled by a cam which makes it move sidewise back and forth just the distance between holes in the button, and keep time exactly with the needle. If four-hole buttons are used a second cam is brought into use which compounds the side-wise motion with a back and forward motion at the same time. This brings the needle first over two holes in a diagonal direction, and then over the other two diagonally. The record of number of buttons sewn on is made by an automatic counter attached to the machine.

A. Pants:

1. Sew buttons on fly: Spill buttons from carton conveniently on bed of machine to right of needle. Put one in foot of machine. Place button side of fly right side up in foot of

machine with mark under center of button. Sew until it has been sufficiently well attached. Repeat with other positions.

B. Jacket:

1. Sew buttons on jacket: Put button in foot. Lay button side of front in foot with mark under center of button. Sew until judged sufficiently attached. Repeat with balance of positions.

Auxiliary Information

Trade Terms:

Materials—buttons, pants, jacket, thread.

Tools—special machine, scissors.

Operations—button sewing.

Location—button side of fly and jacket front.

Stock:

Recognition—pearl buttons by sizes in cartons, No. 80 white thread.

Working properties—nothing special.

Safety: Nothing special.

Care of Tools: Buttons must be placed fair, that is with holes in a line parallel with back of foot, otherwise needle will strike “off” and break.

Drawing, Science and Mathematics: None.

So far as the sleeping wear department is concerned the pajama suit is now complete. The departmental product is checked by the desk girl, and goes down the chute to the folding department.

The second of two typical garments which are to be described in detail as a part of the sleeping wear department product is the night gown. The type selected will be a plain white flannelette with double front and back yokes, the front yoke being trimmed with braid and hem stitching. Sleeves will be full length and cuffed.

A skeleton outline of the making of this nightgown follows:

No.	Payroll Job	Work Jobs
1	First part girl	Join lining and upper front yokes together, sew on braid. Hem front opening. Sew front yokes to body, sew label on back lining-yoke, join back lining-yoke to body, join front and back yokes.
2	Hemstitcher	Hemstitch around edge of braid.
3	Sleeve piecer	Piece sleeves.
4	Sleeve maker	Put cuffs on sleeves.
5	Examiner	Inspect previous workmanship on bodies and sleeves.
6	Bundle boy	Sort bundles of sleeves and bodies to match.
7	Sleever	Join sleeves to body.
8	Feller	Close in sleeves and bodies.
9	Hemmer	Hem bottom.
10	Examiner	Inspect finished garment.
11	Marker	Mark for buttonholes and buttons.
12	Buttonholer	Make buttonholes.
13	Button sewer	Sew on buttons.
14	Buttoner	Button up garment.

DETAILED JOB ANALYSIS

As in the pajama jackets, it will be noted that after the bundles come from the cutting room, the sleeve parts are separated from the others, and two sub-bundles are made with identical numbers on the tags. These run through separately, the bodies going to operators 1 and 2, and the sleeves to 3 and 4, then both to operator 5 separately, after which they are mated into one bundle again by the bundle boy.

PAYROLL JOB—FIRST PART GIRL

The first part girl uses a one-needle machine and is employed exclusively on the yoke construction. In plain yokes her work is continuous, but when certain kinds of fancy stitching are added, the operations are interrupted by this extra work which is done upon other machines by other operators and then returned for completion. In the case of the garment being described, the first part girl joins the front lining and upper yokes together and sews the braid to the upper yoke according to whatever design has been written into the specification for that lot number. It then goes to the hemstitcher and is returned for further processes by the first part girl.

1. Join front upper and lining yokes: Put right half of upper yoke outside on machine wrong side up. Lay corresponding lining yoke on top with wrong side up (i. e. parts both rights together). Sew along neck edge a "foot" away as far as bottom of front edge of yoke. Turn parts right sides out and press seam flat. Lay yoke on machine right side up. Place braid in position a uniform distance from neck and bottom edges, cutting at angles and sewing along all edges. Repeat with left front yoke.
2. Hem opening of body front: Lay front on machine wrong side up. Fold over right or buttonhole side as far as notch on top edge and uniform width to bottom of opening. Turn in the edge and sew along it from top to bottom of opening. Swing garment in machine, repeating with left or button side, but sewing from bottom to top.
3. Join front yokes to body front: Lay right half outside on machine with lining yoke up and bottom edge towards right. Fold back the front or upper yoke underneath far enough to escape being sewn in. Lay body front over right half of yoke right side up and sew to lining yoke from armhole to 1" from notch. Arrange pleat at notch, facing towards armhole and wide enough to bring front hem even with front line of yoke. Complete seam to front edge. Repeat with left front yoke, but work from front opening to armhole. Pull out both yokes from beneath into position, laying upper front yoke over the body front and turning in the lower edge to cover seam. Sew from right shoulder joining armhole

edges together as far as body, then across to right front. Repeat with left part, but work from front hem to armhole then up left armhole to shoulder.

4. Box bottom of front opening: Put body front in machine right side up. Lay right front hem over left, checking length from neck to bottom. Sew a box tack at lower end.
5. Sew label on back lining yoke: Lay back lining yoke in machine right side up. Place label 1" from top edge at middle and size tab under one end. Sew all around edge of label.
6. Join lower back yoke to body: (Note: This operation requires a single folder and also the use of a gathering attachment to take up the extra width of goods in the body back just at the middle of the yoke.) Lay body outside on machine wrong side up. Lay back lining, yoke inside on machine body side up. Insert yoke in folder. Work from right armhole to say 2" from middle of back. Start gathering attachment and allow it to operate until body and yoke are both taut between needle and hands which hold parts at left armhole. Stop gathering attachment and continue seam to end.
7. Join back and front yokes at shoulders: Lay body back outside on machine wrong side up with lining yoke out in position. Lay body front over it right side up with shoulder edges of front parts of yoke and back lining yoke even. Lay upper back yoke wrong side up over front yoke with shoulder edges even. Sew a "foot" away from shoulder edges, working from right armhole around back of neck to left armhole. Pull out body back from beneath to inside position on machine and right side up. Pull upper back yoke over so as to cover its own lining yoke. Sew along shoulder seam from right armhole, then a "foot" away around back of neck, then along shoulder seam to left armhole. Turn in bottom edge of upper back yoke to cover seam, and stitch across from right sleeve opening to left.

Auxiliary Information

Trade Terms:

Materials—front and back yoke pieces, back and front of body, thread, braid, label and size tab.

Tools—single-needle machine, folder, gatherer, scissors.

Operations—joining, hemming, boxing, gathering, turning in.

Location—upper and lower (or lining) yokes, right and left halves of front yoke, back yoke, top edge of body front and body back, right and left armholes, shoulder, neck and lower edges of yoke, right and wrong side up, inside and outside on machine, pleat and pleat notches, a "foot" away, pleats facing towards armhole, front opening.

Stock:

Recognition—yoke and body parts by shape, colors and stripes,
No. 60 white thread.

Working properties—stitch may be made longer in flannel because the soft goods allows it to sink out of sight.

Safety and Care of Tools: Nothing additional.

Drawing and Science: None.

Mathematics: Judging accurately to $\frac{1}{4}$ " the distance from center to start gatherer so as to have the gathered portion of body back centrally spaced.

PAYROLL JOB—HEMSTITCHER

This operator runs a special machine which requires six threads, two being colored floss and four the usual cotton. Just in front of the needle is a plunger which separates the fibres of the goods. The sewing threads below and above hold these openings permanently in shape and at the same time enclose the colored floss along the edges. It is entirely an automatic process.

1. Hemstitch halves of front yoke: Lay piece in machine right side up. Sew through the goods just along and outside of the edge of the braid.

Auxiliary Information**Trade Terms:**

Materials—halves of front yoke, thread, colored floss.

Tools—special machine, scissors.

Operations—hemstitching.

Location—right side up, just outside edge of braid.

Stock:

Recognition—right and left halves of front yoke, No. 60 thread, colored floss by shades.

Working properties—nothing special.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—SLEEVE PIECER

The sleeve piecer operates a two-needle machine with folder. Sleeves come in most cases from the cutting room in two parts or pieces and these have to be sewn together.

1. Piece sleeves: Lay first sleeves in machine right side up, so that back of sleeve lies at outside position (that is, all sleeve seams must face back of sleeve). Set in folder and sew pairs, rights running through from shoulder to wrist, and lefts from wrist to shoulder.

Auxiliary Information**Trade Terms:**

Materials—sleeve-pieces, thread.

Tools—two-needle machine with folder, scissors.

Operations—piecing or hemming.

Location—front and back of sleeve, shoulder and wrist ends.

Stock:

Recognition—front and back parts by shape, No. 60 white thread.

Working properties—nothing special.

Safety and Care of Tools: Nothing additional.

Drawing, Science and Mathematics: None.

PAYROLL JOB—SLEEVE MAKER

The sleeve maker puts cuffs on the sleeves with a single needle machine.

1. Attach cuffs to sleeve: Pair sleeves as check on pieceer. Place first sleeve outside on machine right side up. Lay cuff underneath right side up, and edges even. Sew a "foot" away from edges half way across. Make pleat in sleeve part facing back of sleeve and taking up extra goods until length of cuff and width of sleeve at wrist are equal. Continue seam to end of cuff. Pull out cuff from underneath and fold back over to cover seam. Turn in edge and sew across. Sew across folded edge of cuff a "foot" away. Trim ends of cuff if needed.
2. Tack cuff: Lay sleeve outside on machine wrong side up and cuff edge furthest away. Fold outer end of cuff over and in until $\frac{3}{8}$ " from other end of cuff. Tack along this raw edge about $\frac{1}{2}$ " then edge out. Fold the lower end of cuff over to meet raw edges together and then fold over once again making a $\frac{3}{16}$ " hem. Sew a box tack 1" along on this hem. This holds the cuff and makes a starter for the felling machine. This operation is identical for both right and left sleeves.

Auxiliary Information

Trade Terms:

Materials—sleeves, cuffs, thread.

Tools—one-needle machine, scissors.

Operations—cuffing, hemming, pleating, tacking, edging out.

Location—outside and inside on machine, right and wrong side up, right and left sleeves, back or outer side of sleeve, shoulder and wrist ends.

Stock:

Recognition—sleeves right and left by seam, cuffs by shape, No. 60 thread.

Working properties—nothing additional.

Safety and Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{16}$ ", 1" by eye, a "foot" away.

PAYROLL JOB—EXAMINER

The examiner receives the garment in two separate sub-bundles, which are inspected possibly at different times and without any thought of their connection.

1. Examine sleeves: Inspect piecing seams, cuffs and tacking, looking for run-offs, skips, raw edges and possible defects in goods. Check pairs according to pleat and cut of cuff.
2. Examine bodies: Inspect bodies for similar points, and in addition see that all parts of the yoke fit easily or sit well, that seams a "foot" away are not too far from the edge, and that colors and stripes are not mixed.

Auxiliary Information

Trade Terms:

Materials—sleeves, bodies.

Tools—scissors.

Operations—inspecting.

Location—all parts of garment by name.

Special—run-offs, skips, raw edges, lie flat or sit well.

Stock:

Recognition—sleeves, bodies.

Working properties—nothing additional.

Safety and Care of Tools: None.

Drawing and Science: Nothing special.

Mathematics: Measuring a "foot" away by eye.

PAYROLL JOB—BUNDLE BOY

The duty of bundle boy is to match the sub-bundles by their lot and bundle numbers on card.

1. Select bundle of sleeves from sleeve bin. Find bundle of bodies with similar numbers on tag. Tie these together and place in a third bin.

Auxiliary Information

Trade Terms:

Materials—sleeves, bodies.

Tools—none.

Operations—checking numbers, tying.

Location—special bins.

Stock: Bundles by numbers.

Safety and Care of Tools: None.

Drawing, Science and Mathematics: None.

PAYROLL JOB—SLEEVE

The sleeve uses a two-needle flat-bed machine with folder for joining sleeves to body.

1. Join sleeves to body: Check length of edges of sleeve and trim off at shoulder end if unequal. Snip edges of armhole at intervals. Lay body inside on machine and sleeve outside,

both right side up (seam faces sleeve). Put parts in folder, sewing left sleeve from front towards back, and right sleeve from back to front. Edges must start and end even. Notch on sleeve must meet shoulder seam.

Auxiliary Information

Trade Terms:

Materials—sleeves, bodies, thread.

Tools—two-needle flat top machine with folder, scissors.

Operations—cheeking length, trimming, snipping, joining.

Location—Right and left, front and back, inside and outside on machine, right side up.

Stock:

Recognition—right and left sleeves, bodies, No. 60 thread.

Working properties—nothing special.

Safety and Care of Tools: Nothing special.

Drawing and Mathematics: None.

Science: The turning back of edge of body part in the armhole seam causes it to take a position on a larger circle than at the folded edge. That is, it must be increased in length. If snipped the edge will open up and lie flat. If not it will draw the seam into a puckered effect.

PAYROLL JOB—FELLER

The feeling girl operates a two-needle special machine with folder. The head stands forward from the table 8" or 10", and the bed is small and round so that a closed cuff or tubular sleeve may slide over it behind the needles. The duty of this machine is to close in the arm and side of body.

1. Fell garment: Put cuff of sleeve (already tacked) behind folder and bring edges of the sleeve part into place in folder. Sew from cuff to armhole and down side to bottom of body. Repeat with other side. No thought is taken in this operation for direction in which the seam faces.

Auxiliary Information

Trade Terms:

Materials—garment.

Tools—two-needle special machine with folder, scissors.

Operations—felling.

Location—cuff, armhole, bottom of body.

Stock:

Recognition—garment.

Working properties—nothing special.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—HEMMER

The bottom of the garment is hemmed on a one-needle machine without folding attachment.

1. Hem bottom: Place garment inside on machine. Fold over 1" of underneath layer at center of back and turn in edge as stitching is done completely around to starting point.

Auxiliary Information

Trade Terms:

Material—garment.

Tools—one-needle flat bed machine, scissors.

Operations—hemming, folding over, turning in.

Location—bottom edge of gown at center of back.

Stock: Nothing special.

Safety and Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring 1" by eye.

PAYROLL JOB—EXAMINER

The garment is inspected a second time to check on the sleeving, felling and hemming work.

1. Examine garment: Inspect sleeve seams at shoulder, felled seams and hem at bottom. Check for lying even, straight seams, and for the usual defects on seams.

Auxiliary Information

(See former stage of examiner's work.)

PAYROLL JOB—MARKER

The marker spots positions for buttons by marking through the buttonholes. Only on such garments as have long buttoned parts is it necessary to mark positions for buttonholes. In these cases it is done by marking at V-shaped notches on the edge of a pattern made of heavy cardboard. This part of the job would come naturally before the buttonholer gets the garment. Button positions must always be marked after the holes are sewn.

1. Mark for buttonholes: Lay garment flat and even. Select right size of pattern. Place pattern on right hem of front opening and mark at notches.
2. Mark for buttons: Lay garment flat with front up. Straighten out front hems and mark through holes with a soft black or colored pencil.

Auxiliary Information

Trade Terms:

Materials—garment.

Tools—pencil, patterns by sizes and designs.

Operation—marking.

Stock: Nothing special.

Safety and Care of Tools: Nothing special.
 Drawing, Science and Mathematics: None.

PAYROLL JOB—BUTTONHOLER

The buttonholes are made on a special machine, described under pajamas. On ladies' nightgowns there may be no buttons or front opening so that the job preceding this job and the one following it may also frequently be unnecessary according to the design. In this design the yoke is close fitting about the neck, so that a buttoned opening is needed.

1. Make buttonholes: Place garment in machine with buttonhole hem (right) in the foot. Sew buttonholes as marked.

Auxiliary Information

Trade Terms:

Materials—garment, thread.

Tools—special machine, scissors.

Operations—sewing buttonholes.

Location—right hem of front opening.

Stock: Nothing special.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—BUTTON SEWER

The button sewing machine was described under pajamas. On those night gowns which have front openings, buttons are sewn at marked points.

1. Place button hem of garment in foot of machine. Place button in upper part of foot. Sew until securely fastened.

Auxiliary Information

Trade Terms:

Materials—garment, buttons, thread.

Tools—special machine, scissors.

Operations—placing buttons, sewing.

Location—left hem of front opening.

Stock:

Recognition—pearl buttons by sizes in cartons.

Working properties—nothing additional.

Safety and Care of Tools: Blunt needle breaks buttons.

Drawing, Science and Mathematics: None.

PAYROLL JOB—BUTTONER

The button girl has simply to button up the garment. It is a monotonous job with no attractive features and requiring no particular knowledge.

1. Button front of garment: Start at neck and work to bottom of pleat. Tie into bundles. Deliver to chute to folding department.

Auxiliary Information

Trade Terms:

Location—button sometimes off place by being sewn on a mistaken mark. Report to forelady.

Safety: Sharp edges on imperfect buttons may cut fingers.

Children's Sleeper Department

Children's sleepers are made largely from flannelette, but other lighter cotton goods are used for summer weights. Flannelette is woven and napped so as to be the same on both sides so that there is no right and wrong side to the cloth, but cotton goods are sized and ironed so as to produce a glaze on one side which is generally used as the right side. Some cotton goods are printed on one side. When speaking of the right side of flannelette, we mean the side which becomes the outside of the garment.

Sleepers are union garments, made sometimes with a hood attached at the neck, and also as a rule, though not always, with attached feet. They are mostly footed, and without the hood. Sizes are indicated on the labels by years, ranging from 1 to 14. The design of the garment provides for buttoning from neck down front to bottom of a boxed pleat, and also across the top of a back flap reaching to side openings.

The construction of a sleeper may be summarized in the following way:

No.	Payroll Job	Work Jobs
1	Hemmer	Hem bottoms of backs.
2	First part girl	Sew belt on back, hem buttonhole and button side of fronts, join fronts, make and sew on pocket, sew on toe-pieces.
3	Joiner	Piece sleeves if needed, join backs of pants, join sleeves to body, join shoulders.
4	Second part girl	Hem side openings on pants, sew backband to pants, heel bottom of pants, sew cuffs on sleeves, sew on collar.
5	Feller	Fell sleeves and outside and inside seams of legs.
6	Examiner	Inspect workmanship.
7	Tacker	Tack wrist and side ends of felled seams.
8	Buttonholer	Make buttonholes on front, backband and cuffs.
9	Markers	Mark for buttons.
10	Button sewer	Sew on buttons.
11	Buttoner	Button garment ready for folding department.

DETAILED JOB ANALYSIS

There is sufficient instructional material connected with the various machines and goods used throughout the processes of making this sleeper, to warrant a detailed study of the operations in order that new operators may be given adequate instruction on processes and auxiliary information which goes with them.

In the study which follows it may appear as if but one garment is being made. The reader must interpret always that twenty-four similar garments are going through in each case. Sometimes the operations go singly, sometimes in pairs, or maybe in threes or fours

as the pieces go through once. This is a matter for careful study by operators to determine just what is for them individually the most rapid and efficient method of handling.

PAYROLL JOB—HEMMER

The hemming girl operates a one-needle machine with folder attachment, running a hem across the bottom of the back piece.

1. Hem backs: Lay back outside on machine wrong side up. Put left bottom edge in folder and stitch across to right corner.

Auxiliary Information

Trade Terms:

Material—flannelette, cambrie or print backs, white thread.

Tools—one-needle flat-top machine with folder, scissors.

Operations—hemming.

Location—wrong side up, left and right, bottom edge, setting folder fair.

Stock:

Recognition—backs by shape, No. 60 white thread.

Working properties—flannel gives off a great deal of lint, making it necessary to clean machine more frequently. Absence of starch or sizing makes goods limp, edge of goods must be fed in with fingers close to the folder, and an even tension held on goods to prevent gathering or drawing.

Safety: The folder acts as a guard to the needle.

Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—FIRST PART GIRL

The first part girl operates a one-needle flat top machine without attachments. She works on the front part of the garment with exception of sewing the belt across the middle of back. This belt serves no function beyond being a button-stay.

1. Sew belt to back: Check for even length of right and left side from arm's eye to notch. Lay back inside on machine right side up, bottom edge to the left. Place belt-piece right side up with upper edge opposite notches. Turn in edge and stitch across from left to right, returning similarly on lower edge of belt, but leaving both ends open.
2. Hem front opening: Lay right front (buttonhole side) inside on machine wrong side up. Fold over hem to notch, making uniform width to bottom of opening. Turn in edge and sew down from neck to bottom along inner edge of hem. Lay left front (button side) inside on machine wrong side up. Fold over hem to notch at neck, but narrowing to $\frac{1}{2}$ " width at bottom. Turn in edge and stitch from bottom to neck along inner edge.

3. Join fronts: Lay fronts in machine right side up. Check for length from neck to bottom of hems. Lay right front hem over left and stitch across at bottom of pleat. Turn in edge of right front below pleat to crotch and stitch along edge returning from crotch to front a "foot" away. Box bottom of front hems.
4. Make and sew on pocket: Lay pocket-piece inside on machine wrong side up. Fold over top as far as notches and stitch across top of fold. Lay right front of garment in machine right side up. Place pocket with top edge 1" below arm's eye, and "3 fingers" away from right hem. (If striped goods, match stripes nearest way right or left.) Turn in side edge nearest front, boxing top corner and stitching around to armhole corner with a box tack at finish.
5. Sew on toe-pieces: Lay garment outside on machine right side up. Place toe-piece over bottom of leg wrong side up at level of notches. Stitch around near edge from notch to notch, nothing being turned in.

Auxiliary Information

Trade Terms:

Materials—back, back-belt or button-stay, fronts, pocket-piece, toe-pieces, white thread.

Tools—one-needle flat top machine, scissors.

Operations—checking lengths, hemming, turning in, folding over, boxing, joining, tacking.

Location—arm's eye or armhole, right and wrong side up, outside and inside on machine, right and left sides, buttonhole and button sides, neck, bottom of front hem, crotch, a "foot" away, "3 fingers away," bottom of leg.

Stock:

Recognition—all parts by name and shape, No. 60 thread.

Working properties—nothing additional.

Safety: Needle guard on foot to protect fingers.

Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring $\frac{1}{2}$ ", 1" and "3 fingers" by eye.

PAYROLL JOB—JOINER

The joiner operates a two-needle flat bed machine with a folder. Sleeves may come from the cutting room in whole pieces or in two pieces, some bundles having some of each kind. The joiner checks this and joins or pieces those necessary. She also joins all other parts which are done on the flat with double seams.

1. Piece sleeves: Lay first sleeve in machine right side up, so that back of sleeve lies at outside position (that is, all sleeve seams must face back of sleeve). Set in folder and stitch in

- pairs, right running through from shoulder to wrist, and left from wrist to shoulder.
2. Join shoulders: Lay back of garment inside on machine right side up. Lay front in outside position right side up (that is, shoulder seam always faces front). Set right shoulder in folder, sewing towards neck, following with left shoulder from neck to arm hole. Trim ends of seam if needed.
 3. Join sleeves to body: Lay body inside on machine right side up, and left sleeve outside in position (that is, shoulder seam must face the sleeve). Set front corners of sleeve and armhole in folder and stitch through to back of sleeve. Place right armhole and sleeve in position, stitching from back of sleeve over shoulder to front corner.
 4. Join backs of pants: Place right back outside and left back inside on machine right side up. Set in folder, sewing from crotch to top. Trim ends of seam even if needed.

Auxiliary Information

Trade Terms:

Materials—sleeve-pieces, front and back of garment, backs of pants, thread.

Tools—two-needle, flat bed machine with folder, scissors.

Operations—seaming.

Location—right side up, outside and inside, shoulder and wrist ends, armhole, neck, back and front of sleeve, right and left back of pants, crotch, seam faces backward or sleeve-ward.

Stock:

Recognition—all parts by name and shape, No. 60 white thread.

Working properties—nothing additional.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—SECOND PART GIRL

The second part girl continues the single needle work, putting on cuffs and collars, and hemming sides and top of the pants.

1. Hem side openings on pants: Lay back of pants inside on machine wrong side up. Fold over to depth of side cut on left opening, and to notch on top edge. Sew from bottom of hem to top edge, turning in edge. Repeat with right side opening, sewing from top down and edging out.
2. Sew backband to pants: Double band end to end, and notch edge at middle fold with scissors (used as a marker to notch rest of bundle). Put pants outside on machine wrong side up. Lay band along top edge wrong side up with notch at joining seam. Fold over end of band until even with hem of right side opening. Stitch across top edge, folding over left end of band at finish of seam. Swing garment to inside position, right side up. Pull backband out into position and

fold over just to cover seam. Turn in right end of band, and lower edge. Sew down right end and across lower edge to left opening. Turn in left end of band and sew up, then across top edge towards right. Near right end of band insert label under needle with size tab under its lower edge. Sew once around label and continue seam to end.

3. Heel bottom of pants: Put garment outside on machine right side up. Fold inside bottom corner of right leg over to outside corner. Sew across from outside to fold, about $\frac{3}{8}$ " away, turning no edges in. Repeat with left leg, sewing from fold to outside edge.
4. Sew cuffs to sleeves: Place sleeve of garment in machine wrong side up. Fold over hems for wrist opening from seam out to end notch, sewing up sleeve on one hem and down sleeve on the other. Swing sleeve into outside position and lay cuff over it wrong side up with edges even. Sew across near the edge, folding over ends of cuffband even with sleeve at start and finish of seam. Swing sleeve to inside position right side up and pull cuff out from beneath into position. Fold over onto sleeve to cover seam. Turn in ends and edge of cuff and sew all around. Repeat with other sleeve.
5. Sew on collarband: Fold and mark middle and quarters of collarband by notch with scissors. Put garment outside on machine wrong side up. Lay collarband wrong side up over garment with edges even. Fold over ends even with front hems and sew across near the edge. Swing garment to inside position right side up. Pull collarband from beneath out into position and fold back over to cover seam. Turn in ends and lower edge and sew all around.

Auxiliary Information

Trade Terms:

Materials—garment (fronts and back sleeved), pants, backband, label and size tab, cuffs, collarband, thread.

Tools—one-needle machine without folder attachments.

Operations—hemming, folding, heeling, cuffing, collaring.

Location—right and wrong side up, outside and inside on machine, folding over, turning in, edging out, side openings, bottom of legs, top of pants, wrist, neck, front hems.

Stock:

Recognition—all parts by name and shape.

Working properties—nothing additional.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—FELLER

The feller girl operates a special two-needle machine with folder attachment. The machine head extends forward over the table so

that the closed in garment may pass back over the arm-like bed. The operation consists practically of joining a continuous felled seam from wrist opening to wrist opening, having passed along sleeves, outseams, inseams and feet.

1. Place end of right sleeve opening in folder. Stitch from wrist to armpole and down right side, joining front to back as far as bottom of right side opening. Repeat with left sleeve and side. With garment still in machine, lay left end of backband of pants over belt on back, checking length by notches on front and back at bottom of left side opening. Sew from notch down left outseam, joining front and back of leg. Turning heel and toe parts right side in, continue seam around under arch of the foot to and along left inseam. Continue from crotch around right leg to notch at bottom of right side opening, checking right ends of backband and belt when needle has reached about knee height on the up seam.

Auxiliary Information

Trade Terms:

Materials—garment in two parts, front and pants, thread.

Tools—two-needle, special machine with folder, scissors.

Operations—felling, joining.

Location—right and left wrists and side openings, ends of backband and backbelt.

Stock:

Recognition—body and pants, No. 60 white thread.

Working properties—nothing additional.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—EXAMINER

The examiner inspects all previous workmanship on the sleeper.

1. Examine collar, front pleat and pocket, looking for run-offs, skip stitches, raw edges, tacking, and seeing that parts lie even. Check length of sides of front opening. A difference of $\frac{1}{4}$ " must go back.
2. Examine felling, backband and backbelt for run-offs, skip stitches, raw edges, and see that parts lie even. Check length of side openings.
3. Examine cuffs and sleeves at shoulder for run-offs, skip stitches, raw edges, and see that cuffs lie even.
4. Check for mixed colors or stripes, thin spots or holes in goods. Report defects to forelady, who repairs and marks such garments as seconds.
5. Report defective workmanship to forelady, who returns them to the operator responsible.

Auxiliary Information

Trade Terms:

Materials—child's sleeper, all parts by name.

Tools—none.

Operations—examining, inspecting, checking lengths.

Location—all parts by name.

Special—run-offs, skip stitches, raw edges, thin spots, straight seams, lie even, seconds.

Stock:

Recognition—parts differing in color by shades and stripes, and differing in weight or thickness.

Working properties—none.

Safety and Care of Tools: None.

Drawing and Science: None.

Mathematics: Measuring $\frac{1}{4}$ " and less by eye.

PAYROLL JOB—TACKER

The tacker operates a special machine which has an automatic movable foot sliding over the main bed. The garment is slid into this foot, and when machine is set in operation it slides the goods under the needle three times sidewise, with a straight seam returning the fourth time with a staggered or sawtooth seam crossing the first three stitchings six or eight times. The length of this tacking can be adjusted, but it is usually set for $\frac{3}{4}$ " or 1". The head is set forward so that sleeves may be slid over the end of the arm bed. Record of work done is read from a registering counter linked with the machine so as to indicate the number of tackings made by operator.

1. Tack end of felled seams at wrist openings. Tack end of felled seams at bottom of side openings.

Auxiliary Information

Trade Terms:

Materials—garment.

Tools—special tacking machine, scissors.

Operations—tacking.

Location—left and right wrist and side openings.

Stock: Nothing special.

Safety and Care of Tools: Nothing special.

Drawing, Science and Mathematics: None.

PAYROLL JOB—BUTTONHOLER

The special automatic machine used in making buttonholes, sews around the position with a pearl stitch, then cuts through the goods inside the stitching. Buttonholes are made in cuffs, front pleat and backband.

1. Place outside end of cuff in machine and sew buttonhole.
2. Place outer pleat of front opening in machine, and sew as many

holes as required for size of garment, working from top of pleat to bottom and spacing by eye or chosen points on bed of machine.

3. Place backband in machine and sew as many holes as required for size of garment, working end holes first, then intermediate positions by eye or marks on machine.

Auxiliary Information

Trade Terms:

Material—garment, names of parts, thread.

Tools—special machine, scissors.

Operations—buttonholing.

Location—outer ends of right and left cuffs, front pleat, ends of backband.

Stock: No. 60 white thread.

Safety and Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Measuring position of holes by eye correct to 1/16" on cuffs, 1/8" on pleat or backband.

PAYROLL JOB—MARKER

The marker locates position of buttons by marking with soft pencil through all buttonholes.

1. Lay garment flat with buttonholes and button sides in position and mark through middle of buttonholes.

Auxiliary Information

Trade Terms:

Material—garment.

Tools—soft black pencil.

Operations—laying flat, marking.

Location—cuffs, front pleats, backband and backbelt.

Stock: Nothing additional.

Safety and Care of Tools: None.

Drawing: Marking locations through holes.

Science and Mathematics: None.

PAYROLL JOB—BUTTON SEWER

The button sewer operates a special machine which holds the button in a foot which moves along with the cloth back and forth sidewise far enough to bring the two holes alternately under the needle. This oscillation keeps exact time with the movement of the needle. For four-hole buttons, a second adjustment adds a forward and back motion so that the needle registers over the four holes, first two diagonally till fully sewn, then the remaining two. The number of threads sewn through is a matter of judgment of the operator.

1. Lay buttons of required sizes conveniently on table of machine near foot. Put button in foot with holes square across. Place garment with mark underneath foot and release foot

treadle. Sew according to judgment. Sew on buttons in following order: front pleat from bottom to top, one cuff, across backbelt or button stay, remaining cuff.

Auxiliary Information

Trade Terms:

Materials—garment, pearl buttons, thread.

Tools—special machine, scissors.

Operations—sewing on buttons, adjusting machines.

Location—machine bed, button foot, cuffs, front pleat, back belt.

Stock:

Recognition—two or four-hole buttons, firsts or seconds, No. 60 white thread.

Working properties—nothing special.

Safety: Second buttons have sharp or wane edges which frequently cut fingers.

Care of Tools: Button must be set in fair or needle will strike "off" and break.

Drawing, Science and Mathematics: None.

PAYROLL JOB—BUTTONER

The buttoner closes up all parts of the garment. There is no given series for buttoning operations which would be better than another. The girl adopts an order which is for herself most rapid and saving of effort. Auxiliary knowledge is so slight as to be almost negligible.

Auxiliary Information

Trade Terms:

Materials—garment.

Tools—none.

Operations—buttoning.

Location—front, cuffs, backband.

Stock: Nothing additional.

Safety: Handle buttons so as to avoid cuts from sharp edges on seconds.

Care of Tools: None.

Drawing, Science and Mathematics: None.

The child's sleeper is completed so far as the Sleeping Wear Department is concerned when the buttoner has finished. The bundles are turned in to the desk girl for recording, and are afterwards sent down the chute to the Folding Department.

Folding Department

All garments from the Sleeping Wear and Children's Sleeper Department are delivered to the Folding Department in bundles of twenty-four. It is the work of this department to fold, press, sort and box the garments. In this particular department there is included also the product of branch factories which have made up

special lines such as men's fancy shirts and work shirts. The range of garments folded and boxed covers men's night shirts, pajamas, pajunions, work shirts and fancy shirts; ladies' nightgowns, pajamas, pajunions and pajunettes; and children's sleepers. A few children's rompers and ladies' bloomers are produced, but these are only specials. The standard lines are sleeping wear and shirts.

A general view of the department is shown by the following schedule:

No.	Payroll Job	Work Jobs
1	Folder	Fold nightshirts, pajamas, pajunions, pajunettes, nightgowns, sleepers, work shirts, fancy shirts.
2	Presser	Press fancy shirts, work shirts, pajamas, pajunions and pajunettes, white nightshirts, all summer garments.
3	Label girl	Label boxes.
4	Boxer	Sort folded and pressed garments according to size and colors, tie in bundles and wrap, box and tie.

DETAILED JOB ANALYSIS

Since the purpose to be served by this study is to provide data which may be used by instructors particularly with girls who are employed in departmental jobs, a detailed analysis will cover only such employments as are suitable for girls, and will include only among these such as are concerned with the garments which were detailed in manufacture, namely, nightgowns, pajamas and sleepers. All garments are folded in the same general way, slight differences can be enlarged only on the job.

PAYROLL JOB—FOLDER

This work is done exclusively by girls. The folding table is somewhat higher than ordinary tables so that working conditions may be comfortable. The folder thinks of the left end as the top and garments are always laid top to left. The surface of the table is marked crosswise from a top line to indicate the sizes of boxes into which garments are afterwards packed. Folds are then made within these particular lines. Small sleepers are folded extra small for packing two side by side in boxes. Folding-boards made of heavy millboard are used in some garments to control shape and size. The board is withdrawn before pinning has been completely finished.

1. Fold pajamas: Straighten out pants at top and with legs even. Lay on table with top at top line. Arrange and pin girdle with fringed ends out at middle of top end. Fold legs up until bottoms are past top line 8" or 10". Lift upper leg and fold underneath itself, its fold being even with top line, leaving end of lower leg extending out. Pin and place aside. Lay jacket front down, even with top line. Lay pants over jacket with tops even. Lay over the near and far sides and pin. Fold sleeves back out with cuffs extending over edge, and pin. Fold bottom up to required line on table and pin

end in place. Fold remaining pant leg back over onto body and pin into position. Turn garment over and pin cuffs to front of jacket. This leaves garment so that front shows jacket and style of cuffs, and label on inside of back yoke, while back shows ends of girdle (plain or fringed) and style of pants bottom—plain, or looped and buttoned.

2. Fold sleeper:

a. Large sized garment—Lay face or front up, with top at top line. Fold sleeves across breast. Fold feet up to required folding line on table. Fold over again even with top. Turn garment over and pin at edges.

b. Small sized garment—Lay face up. Lap over sides to near middle and fold sleeves in to neck edge and then over and down with cuffs lying side by side. Fold bottom to mark. Fold over once again to top. Turn garment over and pin at edges. Both of these folds show label on outside near right end of backband.

3. Fold nightgown: Lay garment face down. Fold over sides part way to middle. Re-fold edges back over so as to get sleeves outside side lines. Fold bottom up until at required mark on table. Fold over once again to top. Pin parts together. Turn garment over and pin sleeve cuffs across front of gown. This shows label on inside of back yoke, and style of cuffs, yoke, and front pleat.

Auxiliary Information

Trade Terms:

Materials—pajamas, sleepers, nightgowns.

Tools—folding-boards, pins.

Operations—folding, lapping over, pinning.

Location—top line on table, various folding lines on table, front of garment up or down on table, near side and far sides of garment as it lies on table, fold under, fold over, fold up (from right to left or top end).

Stock: Nothing special.

Safety and Care of Tools: None.

Drawing, Science and Mathematics: None.

PAYROLL JOB—PRESSER

The pressing of garments varies considerably. Some are partly pressed before folding, and finished afterwards, others are not pressed until after folding, and some not at all. The work being relatively heavy, it is not given to young girls, but is given to men and women who are physically able to work without undue fatigue. Two types of irons are used, one being gas heated, and the other electrically heated. The latter is the type commonly used in the home, and is used by the women pressers. The gas heated iron also

has steam connection to moisten the garment as it is ironed. This iron is considerably heavier and is used exclusively by men.

No detailed analysis is made of this job because girls are not except in exceptional cases given this work to do.

PAYROLL JOB—LABEL GIRL

The duties in this are two-fold according as the garments are to be enclosed in cardboard boxes or wrapped in paper bundles.

1. Prepare wrappers: Tear off paper from roll in size according to descriptive sheet specification for particular lot number. Stick gummed label on each sheet in such position that it will show later on wrapped bundle just at the end of the bundle.
2. Prepare boxes: Consult descriptive sheet for size and kind of box for particular lot number. Count out number of boxes required. Stick labels on boxes or covers according to kind.

Auxiliary Information

Trade Terms:

Materials—wrapping paper, boxes, labels.

Tools—paste and brush.

Operations—tearing off, labeling, counting out.

Location—position of label on sheet for various sized bundles, label on end of box or cover according to its style or size, stock-piles of empty boxes by sizes, and lot numbers.

Stock:

Recognition—know empties by description on sheet, know labels by stamped sizes.

Safety: None.

Care of Tools: Nothing special.

Drawing and Science: None.

Mathematics: Figuring number of boxes needed for particular lot number. Counting out boxes as tied in bundles of 3's, 4's, 6's, or more.

PAYROLL JOB—BOXER

The boxers have two main work jobs, one boxing and the other bundling, that is wrapping in paper bound bundles instead of in boxes.

1. Sorting: Sort garments into piles according to sizes, and also to colors in goods, or color of trimmings. Collect from piles in dozens, or in fractions of a dozen as $3/12$, $4/12$ or $6/12$ dozen, having same size but assorted colors.
2. Bundling: Check sizes, style and quantity on garment labels with those on wrappers. Lay wrappers on table, labels down. Tie bundles. Place bundle of garments in position. Wrap and tie. Stack on truck.
3. Boxing: Check sizes, style and quantity on garment label with

those on box. Place sorted bundles in box. Put on lid and tie box. (In higher priced garments and all summer lines the boxes are lined with special tissue paper carrying the firm trade mark, before bundles are placed in the boxes.

Auxiliary Information

Trade Terms:

Materials—garments, wrappers, boxes, twine, lining tissue paper.

Tools—Scissors.

Operations—checking, tying, wrapping, laying in boxes, stacking on truck.

Location—wrappers with label side down.

Stock:

Recognition—folded garments by name and shape.

Safety and Care of Tools: None.

Drawing and Science: None.

Mathematics: Estimating length of twine correct to 6" for completing tied bundles, counting out garments in dozens or fractions of a dozen.

After bundles and boxes have been tied and stacked on the trucks by the folding department, the manufacturing has been completed. They are then sent to the Stock Room.

VII. USE OF INSTRUCTION SHEETS

Instruction is measured as to its success by what the learner can do as a result of it. Good instruction is also a cost cutting factor in the degree that it is accomplished in the shortest possible time and with the elimination of unnecessary effort on the part of instructor and learner. This means the use of any effective teaching devices which can be worked up. Good instruction sheets prepared in advance save considerable time, and make possible a better selection, arrangement and presentation of subject matter. The sheet is not a substitute for personal instruction. It is a supplement to it. It is the lesson summary in permanent form with some test exercises attached, and is intended to be handed to the learner only after a personally conducted lesson has been put over.

The following sample instruction sheet has been prepared to illustrate what can be done in part-time and vestibule schools by means of such a device. The vestibule school may not make use of all the material which appears on these sheets because its objective is not so inclusive as the public part-time school objective, but the objective of the vestibule school should be inclusive of much more than it has been in the past, if it is to accomplish results that employers expect of it.

It will be rightly judged that the sample is somewhat long. The fact is that such a lesson sheet would be fitted in among others ahead of and following it, so that some questions appearing here might appear with equal effectiveness on other sheets. Their presence

here in such numbers is rather to indicate the possibilities than to suggest exactly what might appear on this instruction sheet when placed among others in service. It is necessary, however, to have "repeat" questions frequently.

Charting the operations will lead to some study of their efficiency, and should produce frequent revisions by the up-to-date instructor, showing shortened time or reduced number of motions. The result will be standardized operation sheets.

Under the heading of related instruction the purpose is to start the new girl thinking about her job, as her own, and also in relation to the whole product. It is evident that many more questions could be added.

The reference to a drawing clears up points of doubt, and also serves as a record of things talked about which might otherwise slip by. Have the learner draw her own at times.

The mathematics will bring the question of relative speed to the girl's attention at the start and will give her a means of computing her attainment from day to day. It will also reveal the fact that the company is losing money in proportion as she is paid a bonus. In the early training period the company loses most, in the later training period she herself loses most by not being up to average speed.

In the part-time school there should be as much exercise work in English as can be worked in about the job which is to be, or has been done. These will suggest themselves to every interested teacher. In the vestibule school it is not expected that such exercises would be carried through but it is advisable that the instruction suggested by these exercises be given.

Instruction sheets ought to be prepared in advance of the lesson to be taught, and carefully checked through with someone in the employ of the company competent to pass authentic judgment upon them. The checking of these in preparation is a real coordinating duty of the part-time school instructor. When so passed, they should be stencilled and sufficient copies run off to serve the purpose of the school for some time in advance. That is, there should be available a copy to give to each learner, so that she has at the end some real reference material to use when needed. Once the labor of preparing these has been expended, the instructional job of the teacher will be considerably lightened in the checking and follow-up part of her duties particularly.

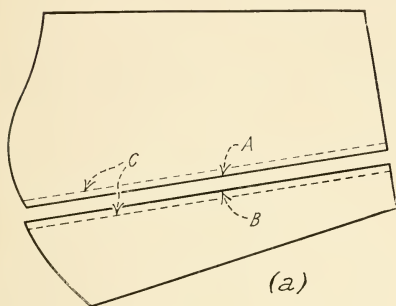
Instructors will find in sections IV, V and VI of this analysis a large field for suggestive questions. So large in fact is it that the problem of the teacher will be not, what can I find to put in, but rather what shall I leave out? It is hoped that with such suggestive material at hand for use of instructors in the needle trade, and an assurance that these instructors can use it advantageously, the labor of compiling it will have been a service worth rendering to the cause of vocational education.

**Part-Time Trade Preparatory School
Job Instruction Sheet**

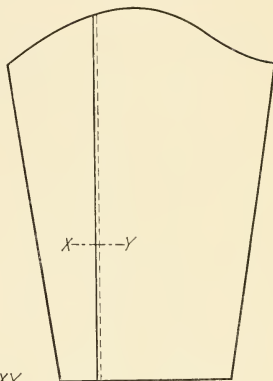
Needle Trade

Lesson.....

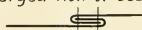
Job—Piece two dozen pairs of men's pajama jacket sleeves.



(a)



(b)

Enlarged view of seam at XY

(c)

Operations

Note: Instructor will have given instruction on and demonstrated the use and care of machine in previous lessons, so that learner knows the machine and can operate it in running a straight row of stitching.

1. Open bundle and check edges A and B of sleeve-pieces.
2. Lay bundle of larger pieces in convenient position on lap, and the other at left side of machine on top of table, having the right side of both bundles up.
3. Place smaller piece outside on machine right side up, and enter shoulder end of joining edge (if right sleeve) in lower seroll of folder. (If left sleeve, insert cuff end in seroll.)
4. Place larger piece inside on machine right side up, and insert corresponding end of joining edge in upper seroll of folder.
5. Start machine, and guide pieces through to end of seam.
6. Repeat operations 3, 4 and 5 with next on top of bundles. (It will be the mate of the first sleeve to form the pair, and will be run through from opposite end.)
7. Continue operations 3, 4, 5 and 6 until bundle is all through.

8. Pull mass from behind machine, snipping threads connecting each sleeve, trimming shoulder end of seam when necessary, and laying sleeves in flat bundle (by pairs) on lap as trimmed.
9. Tie bundle, and mark tag with operator's number.

Related Instruction

Shop Knowledge—

1. The seam should be so placed as to lie on the back of the sleeve when sewn into jacket, and lap of seam should face towards the back. What reasons can you give for this?
2. Why should the smaller pieces be placed to the left of the machine head and the larger pieces in the operator's lap?
3. Why check the A and B edges of the first two pieces?
4. Would it make any difference to you if you performed operation 4 before doing operation 3? If so, what and why?
5. Why do you retard the lower or outside piece, and allow the upper to feed through freely?
6. What is the name of the goods you are using? Is it cotton, silk, linen or wool? Is the pattern woven into or printed onto it?
7. Why is it suitable for the purpose for which it is used? Why do you think the purchasing department selected it?
8. In certain sizes of garments the sleeves may be cut with half of the bundle in one-piece sleeves, and the other half in two pieces. How do you account for it?
9. What length of stitch are you using? Why? What size of thread?
10. To whom will the sleeves go after this job? What will be done to them then? Should the trimming operation belong to this job or the next? Why?

Drawing—

1. In figure (a) of the drawing, what do dash lines "C" represent? Are there any such lines on the cloth?
2. Indicate the position of the "C" lines in figure (c). In figure (b). Where are these places on the scrolls of the folder?
3. Is figure (b) a sketch of a right or a left sleeve? Why?
4. What do the two vertical lines in figure (c) mean?
5. What difference do you find in starting the shoulder end from that of starting the cuff end into the scrolls of the folder? Which is the easier? Why?

Mathematics—

1. Make a record of the time you start and finish the bundle. Subtract to find the time required. How many bundles per day could you run at this rate?
2. If the piece-rate is 5 cents per dozen, how much would you earn per day of factory length? Per week of factory length?

3. How many bundles would you have to do in a day to earn the average daily wage of \$2.00?
4. What fraction represents your daily rate in bundles compared with the average daily rate?
5. Which one of the following fractions comes nearest to representing your efficiency: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$? What would it be in per cent?
6. How much are you being paid for this week's work? If your earnings are indicated by your answer to question 2, how much is the company "out" because you are only learning how to earn? How much are you yourself "out" because you are not yet up to the average?
7. If you spoiled six pairs of sleeves irretrievably, and had the cost of the goods deducted from your pay, how much would you lose if the goods cost $10\frac{1}{2}$ cents per yard of 36" width, assuming that the pieces were cut side by side in the most economical arrangement?

English—

1. Write in your notebook the meaning of the following terms:

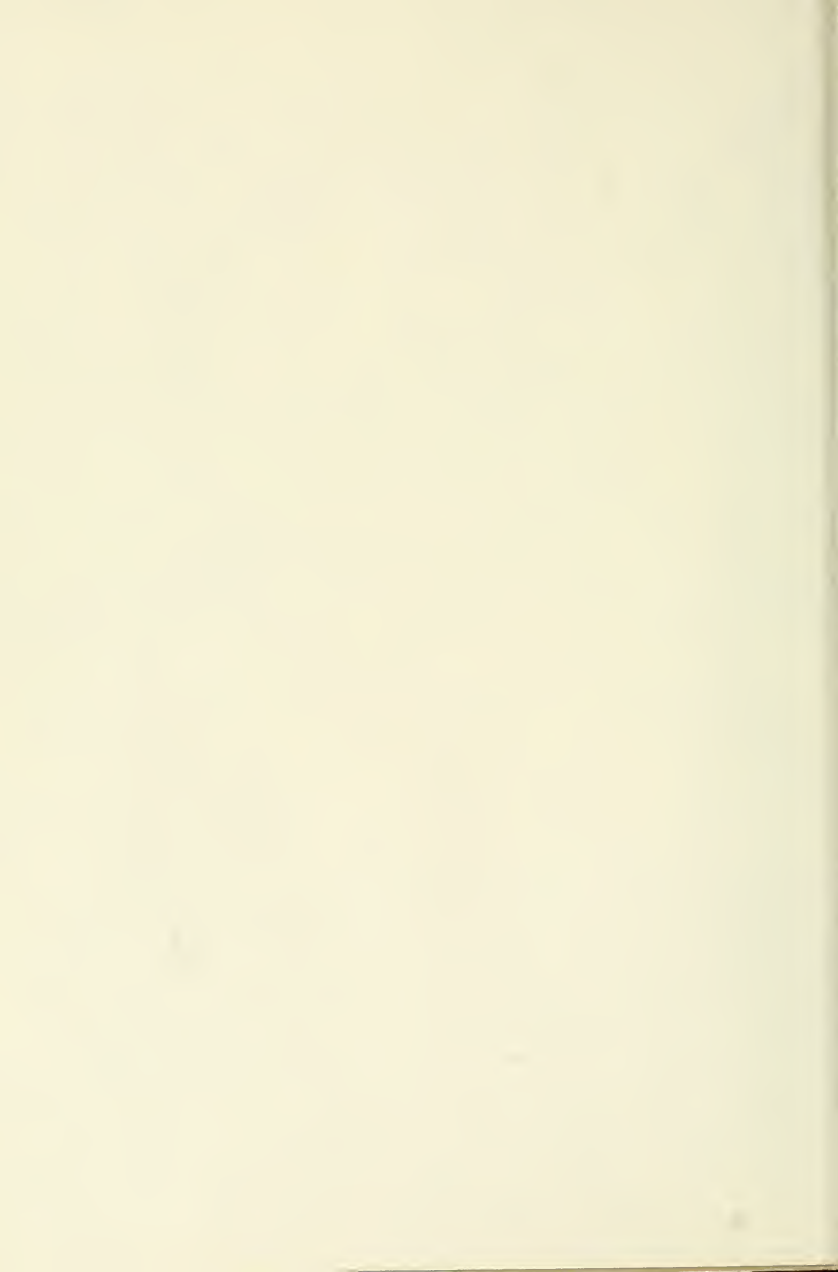
sleeve-pieces	folder
joining edge	scroll
shoulder end	presser foot
seam faces back	tension
cambric	retard
2. Read from some selected source about the manufacture of cambric.
3. Write from memory a half page or more telling how it is made.

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